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ALEXANDER VON HUMBOLDT.

(From the portrait by Schrader, in possession of Albert Havemeyer, Esq., New York.)

In 1970 the A.A.G. Committee on Archives and Association History was established. Since that time the Committee has arranged numerous sessions and workshops concerning the history of geographic thought, facilitated the establishment of an official archival repository, supported Maynard Weston Dow's "Geographers on Film" project, advised on the U.S. bio-bibliography contribution to **Geographers**, and otherwise sought to foster and encourage study of geographical thought. The first number of the **History of Geography Newsletter** was published in December 1981.

The purpose of the **Newsletter** is to provide an outlet for articles, summaries, reports of events, reviews or notices of literature et al. relating to the history of geographic thought. If you have something of this genre which you feel would be appropriately placed in this publication, please submit same to the editors. It is anticipated that this **Newsletter** will be published occasionally, but nevertheless not infrequently.

Klaus D. Gurgel joins with me in producing this number of the **Newsletter**. Our thanks to Raymond O'Connell of the John Wiley Company for helping to arrange a revenue-producing advertisement on the end cover of this **Newsletter**. This helps to defray some of the costs associated with this enterprise. Recognition for help received in typesetting the manuscripts for this **Newsletter** is extended to Ruth L. Gurgel of the Atlas Publishing Company.

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Charles Darwin and the Development of Geography in the Nineteenth Century

By Patrick Armstrong
University of Western Australia

Introduction

IN THE FIRST few decades of the nineteenth century, in the English-speaking world at least, the boundaries of the geographical discipline had not firmly emerged. The accepted norm of the time was for physical geography to be considered part of geology. For example, in the British Association for the Advancement of Science, Section C, originally Geography and Geology, became Geology and Physical Geography in 1839; from 1851 until 1878 a separate section united Geography with Ethnography.¹ It may be partly because of this lack of rigidity in the barriers between the branches of science that certain of Darwin's postulates, not primarily geographical in conception, had a considerable affect on the development of geographical thought.

Some Early Influences on Darwin

Although his writings have had a profound effect on the subject, Darwin certainly never thought of himself as a geographer, nor indeed, as a biologist. At times a geologist, botanist, zoologist, Darwin was above all a naturalist: it was as Ship's Naturalist that he was appointed to **HMS Beagle** in 1831, and late in his life he wrote that one of the most important influences on his work was his need to be esteemed by his fellow naturalists! Others, with firmer links with academic geography also used the term quite happily; H. Berghaus (1797-1884), in the English edition of his atlas, in 1843, acknowledges his debt to "German and British naturalists."²

The title naturalist was perhaps used, in those days, with rather greater deference than today, partly because of the great tradition of the English parson-naturalist, epitomised by such figures as John Ray (1627-1704)³ in

the seventeenth century and Gilbert White (1720-1793)⁴ in the eighteenth, and perhaps partly because the nineteenth century was particularly the era of the polymath mind that the designation naturalist to some extent implied.⁵

We need look no further than the person of the Reverend Professor John Stevens Henslow (1796-1866) to see the power of these influences on Charles Darwin. Henslow was, besides being Vicar of the Parish of St. Mary the Less in Cambridge, Professor of Mineralogy (1822-1827) and then Professor of Botany (1827-1861). Darwin in his autobiography affectionately recalls Henslow's learning in "every branch of science." Professor Henslow was Charles' friend and teacher while he was at Cambridge, and was instrumental in obtaining the **Beagle** position for him. The link was continued during the voyage, for Henslow received in Cambridge the crates of specimens that Darwin despatched; they corresponded regularly and Darwin had in his cabin some of the Professor's works, and there is evidence that he referred to them, particularly the geological writings, quite extensively.

Until after the first two years of the **Beagle's** voyage, Darwin saw himself as continuing the parson-naturalist tradition. He had gone up to Christ's College, Cambridge, with a view to entering the ordained ministry of the Church of England; he had followed his schoolboy hobby of beetle-collecting while at Cambridge, and indeed the argument that natural history was an appropriate activity for a country clergyman was one of the factors that persuaded Charles' rather difficult father to allow his son to take the Ship's Naturalist appointment.

There is a most interesting coincidental link between John Henslow and another most important influence upon the work of the young Darwin. Charles took with him a copy of Alexander von Humboldt's **Personal Narrative of Travels to the Equinoctial Regions of a New Continent, 1799-1804**,⁶ inscribed as follows:

J.S. Henslow to his friend C. Darwin, on his departure from England upon a voyage around the world, 21 September 1831.

We may note in passing that there are a number of comparisons that can be made between the careers of Darwin, the naturalist, and the most eminent German geographer, Humboldt. Both had an early interest in geology: Darwin in the summer of 1831 had made an extensive geological excursion through North Wales in the company of Professor Adam Sedgwick, who held the Chair of Geology at Cambridge between 1818 and 1873, and Humboldt was for several years a mining geologist. Humboldt travelled in South America during the years 1799-1804; Darwin in the *Beagle* wandered up and down the South American coast, making a number of forays inland, between 1832 and 1835. Both wrote general accounts of their travels relatively early in their careers, and only much later completed their major "scientific" works: Humboldt's **Kosmos**⁷ was published in five volumes between 1845 and 1862, while Darwin's **Origin of Species** appeared in 1859. Some of their views were comparable: in the preface to **Kosmos** Humboldt observed that we should consider each organism as part of entire creation, and to recognise, in the plant or animal, not merely an isolated species, but a form linked to other forms, living and extinct. In this Humboldt was something of an **avant courier**, by several years, of ideas expressed in the **Origin**. Other analogies could be drawn. But Humboldt's most important influence for Darwin, as for so many others, was through his **Personal Narrative**: Darwin's autobiography⁸ acknowledges this:

During my last year at Cambridge I read with care and profound interest Humboldt's **Personal Narrative**. This work and Sir J. Herschell's **Introduction to the Study of Natural Philosophy** stirred up in me a burning zeal to add even the most humble contribution to the noble structure of Natural Science. No one or a dozen books influenced me nearly as much as these two. . .

In a letter to Professor Henslow (27 July

1831)⁹ during the summer before the start of the *Beagle* voyage, when Darwin was thinking of going with some other naturalists to the Canary Islands he wrote: "I read and re-read Humboldt; do you do the same?"

Darwin must frequently have referred to Humboldt's **Narrative**, both during the sojourn on the *Beagle* and during the revision of his journal prior to its publication as **The Voyage of the Beagle**.¹⁰ In mentioning, for example, the weathering of syenite to a blackish crust, the effects of atmospheric haze on the appearance of landscapes in the tropics, the relationships between forests and climate or the emergence of animals from the mud of dried-up lakes following inundation, Darwin often and again compares his observations with those of Humboldt, usually quoting him deferentially.

Humboldt's writings must have been in Darwin's mind, and the **Personal Narrative** open on the poop-cabin table long after the *Beagle* had left South America. Here is but a single example of Humboldt's influence of the Ship's Naturalist. First, an extract from Darwin's Geological Diary¹¹ description of King George's Sound in the south-west of Australia:

March 1836 King George's Sound

The basal rock in the whole of this neighbourhood is granite. It varies exceedingly in its nature; the most ordinary varieties are a common grey kind, a ferruginous, slightly quartzose one, and a handsome stone composed of very large oblong crystals of feldspar, little quartz, black mica, which latter infrequently is replaced by Hornblende. - In several places the crystals of Mica and Hornblende are very obscurely arranged in vertical planes. - Sometimes the arrangement is sufficiently developed to cause the rock to wear away into thick plates - generally, however the lines can only just be perceived. I could not observe any determinate direction in the places, & not infrequently they were irregular and curved. Where this structure occurs, the rock would be dominated according to Humboldt by a gneiss-granite. Indeed on entering the sound in the Vessel, I saw that peculiar form of bare smooth conical hills appearing to be composed of great folding layers, which is found in Brazil & in the Mountains of Venezuela, I at once suspected that the observation of Humboldt of the frequency of this form in the hills of gneiss-granite, would be verified in this part of Australia.

Darwin obviously had in mind Humboldt's descriptions such as the passages that follow:

At San Fernando de Atabapo... the surrounding rock was... granite passing into gneiss... The granite of those countries, by the disposition which the thin laminae of black mica affect, sometimes resembles graphic granite; but most frequently, and this determines the age of its formation, it passes into a real gneiss. Its beds, very regularly stratified run from south-west to north-east, as in the Cordillera on the shores of Caracas. The dip of the granite-gneiss is 70 degrees north-west. It is traversed by an infinite number of veins of quartz, and which are three or four, and sometimes fifteen inches thick.

Personal Narrative, Book VII,
Ch. XXII, pp. 223-224.

We passed the rapids of Guahiboes and Garcita... We landed... on the eastern bank of the Oroonoko... We climbed with difficulty, not without some danger, a steep rock of granite, entirely bare. It would have been almost impossible to fix the foot on its smooth and sloping surface, if large crystals of feldspar, resisting composition, did not stand out from the rock, and furnish points of support... A narrow ridge led us to a neighbouring mountain, the rounded summit of which supported immense blocks of granite. These masses are more than forty or fifty feet in diameter; and their form is so perfectly spherical, that appearing to touch soil only by a small number of points it might be supposed at the least shock or earthquake they would roll into the abyss... their position on the summit of a hill alike granitic makes it more probable that they owe their origin to the progressive decomposition of the rock.

Personal Narrative, Book VIII,
Ch. XXIV, pp. 615-617.

Darwin had read and re-read Humboldt's book by the time he arrived at King George's Sound (besides having travelled extensively in South America himself). In seeing the rounded granite forms, the alignment of the mica crystals, the transition between rock types and the abundance of veins, he indeed must have felt that he was seeing the West Australian landscape with Humboldt's eyes. The effect was profound.

There are indeed strong similarities in structure and style between the *Personal Narrative* and the *Voyage of the Beagle* - for example the general diary format, with occa-

sional digressions, the strong comparative approach, and the interpolation of the observations and views of others with first-hand descriptions. This is surely not simple coincidence.

It is perhaps thus not too fanciful to see in some of Charles Darwin's *Beagle* writings, the influence of both Humboldt and the English Naturalists' Tradition. Both were probably instrumental for developing his eye for detail, 'feel' for landscape and remarkable integrative powers. All these characteristics, incidentally, we deem appropriate to a geographer! Darwin had the ability to assess and convey with remarkable succinctness the totality of a landscape or environment. It is unnecessary for me to quote extensively in order to demonstrate this: an almost casual opening of *The Voyage of the Beagle* will provide an instance. I shall simply mention Charles' brief description of Western Australia - the state in which I now make my home: his description of the King George's Sound area is but two pages in length, yet in that succinct piece of prose he mentions, however briefly, the rocks, soil, the weather, plants, animals and Aboriginal inhabitants, and conveys convincingly the unfriendly nature of the West Australian bush. I have used his account with students as an example of landscape description!

Humboldt's powers of detailed observation and his integrative approach are likely to have been important influences on Darwin, even after he returned to England. Edward Manier in his *Young Darwin and his Cultural Circle*¹² has drawn attention to the fact that in his *Transmutation Notebooks* (B, C, D, E, M and N) Darwin quotes Humboldt eight times. Finally we may note that towards the end of his life (6 August 1881) he wrote to his friend and colleague Dr. J.D. Hooker:

I believe that... Humboldt [was] the greatest scientific traveller who ever lived. I have lately read two or three volumes again. His Geology is funny stuff; but that merely means he was not in advance of his age. I should say he was wonderful, more for his near approach to omniscience than for originality. Whether or not his position as a scientific man is as eminent as we think, you might truly call him parent of a great progeny of scientific travellers, who, taken together, have done much for science.

**The Evolution of the Twin Thought-forms
of 'Gradualism' and the 'Connectedness'
of Organisms and their Environments**

Humboldt has been described as 'the father of physical geography,' and Charles Lyell (1797-1875) the 'father of modern geology.' As we have seen the boundaries twixt physical geography and geology were relatively uncrystallised, and we should not, perhaps be surprised to learn that the **Popular Narrative** and Lyell's **Principles of Geology** were open side by side upon the chart table upon which Darwin worked. In yet another of the coincidences that seem to characterise nineteenth century science, we find that Darwin's copy of Volume I of **Principles** is inscribed: 'Given by Captain R. FitzRoy.' FitzRoy (1805-1865), of course, was the enigmatic commander of **HMS Beagle**: distinguished hydrographer and meteorologist, competent geologist, and, years later, vigorous opponent of Darwin's evolutionary ideas.

Lyell's finely written book is subtitled: **An Attempt to Explain the Former Changes of the Earth's Surface, by Causes Now in Operation**,¹³ and is a brilliant exposition of the doctrine of uniformitarianism - the notion that the history of the earth can be explained in terms of the long-continued action of processes that are going on NOW. According to Lyell, the physical world was undergoing gradual but continuous change, governed by ascertainable natural laws. Darwin had found these ideas extremely useful when viewing, for example, the mountains and rivers of South America, and the volcanic islands of the Pacific: an extrapolation backwards in time of the processes he was able to observe was sufficient to account for the diversity of the planet's features. However, from late in 1835 onwards, he was struck by the power of organisms to modify their environment. Particularly, of course, he was impressed by the ability of coral polyps to produce land. In October and November 1835 the **Beagle** made her long passage from the Galapagos to Tahiti.

We passed through the Low or Dangerous Archipelago, and saw several of those curious rings of coral land, just rising above the water's edge, which have been called Lagoon Islands. A long and brilliantly white beach is capped by a margin of green vegetation; and the strip, looking either way, rapidly narrows away in the distance and sinks beneath the horizon. From the mast head a wide expanse of smooth water can be seen within the ring.

These low coral islands bear no proportion to the vast ocean out of which they abruptly rise; and it seems wonderful that such weak invaders are not overwhelmed, by the all-powerful and never tiring waves of the great sea, miscalled the Pacific.

Voyage of the Beagle, Ch. XVIII

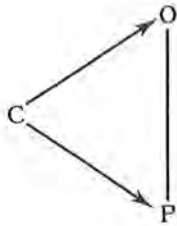
An intensive period of survey in Tahiti followed, and by the end of the year, before he had arrived in Australia, he had prepared the first draft of his paper on the origin of coral islands. In this he set forth his idea that fringing and barrier coral reefs and atolls are successive members of a series formed as the result of rising sea-levels or subsidence of islands. In other words, in relation to island environments at least, organisms were able to effect changes in the physical environment. Howard Gruber¹⁴ has set out his model of the changes that occurred in Darwin's world view in a series of diagrams, reproduced here in Figure 1.

Another notion that Darwin must have come across in reading Lyell, perhaps during that long passage across the Pacific after the **Beagle's** visit to the Galapagos Islands, was the possibility of the mutability of species, the concept that grew into the **Origin of Species by Means of Natural Selection**,¹⁵ in 1859. Lyell in his first edition (1830-1833) is exceedingly cautious, but appears to come close to admitting the possibility of the mutability of species. We know that Charles had the second volume of Lyell's **Principles** in his cabin when he visited the Galapagos and the Pacific coral islands. In that volume appear the following passages:

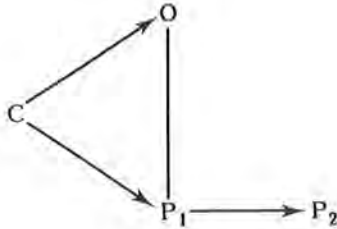
Having shown in the last chapter how considerably the numerical increase or the extension of the geographical range of one species must derange the numbers and distributions of others, let us now direct our attention to the influence which inorganic causes described in our first volume are continually exerting on the habitations of species.

No sooner had a volcanic isle been thrown up than some lichens begin to grow upon it, and it is sometimes clothed with verdure while smoke and ashes are still occasionally thrown from the crater. The cocoa, pandanus and mangrove take root upon the coral reef before it has fairly risen above the waves.

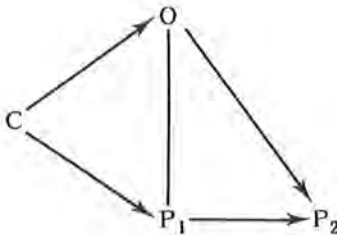
Every flood and landslip, every wave which a hurricane or earthquake throws against the shore, every shower of volcanic dust and ashes



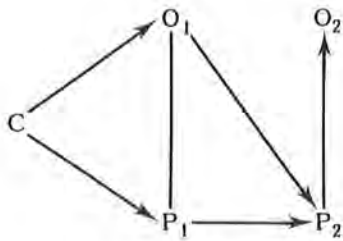
- (i) 1832 and before. The Creator (C) made an organic world (O) and a physical world (P). O is perfectly adapted to P.



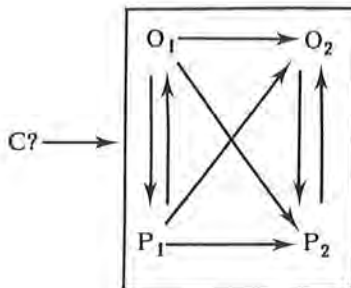
- (ii) 1832-1834. (Geological explorations in S. America.) The physical world undergoes continuous change governed by natural laws summarised in Lyell's **Principles of Geology**.



- (iii) 1835. (The Pacific.) The activities of living organisms contribute to the evolution of the physical world, as exemplified by the action of coral organisms in building coral reefs.



- (iv) 1836-1837. (The Voyage home and after.) Changes in the physical world imply changes in the organic world if adaptation is to be maintained; the physical milieu induces appropriate biological adaptations.



- (v) 1838 and after. The physical and organic worlds are continuously evolving and interacting with each other. The Creator, if he exists, may have set the natural system in being, but does not interfere with its operation.

Figure 1. Darwin's changing view of the world (after H. Gruber).

which buries a country far and wide to the depth of many feet, every advance of the sand-flood, every conversion of salt-water into fresh when rivers alter their main channel of drainage, every permanent variation in the rise or fall of tides in an estuary - these and countless other causes displace in the course of a few centuries certain plants and animals from the stations they previously occupied.

Principles, Vol. II, p. 158

Species. . . are, in general, local, some being confined to extremely small spots. . . Hence it must happen that when the nature of these localities is changed, the species will perish.

Principles, Vol. II, p. 166

If the reader should infer, from the facts laid before him in the proceeding chapters, that successive extinctions of animals and plants may be part of the regular course of nature, he will naturally inquire whether there are any means provided for the repair of these losses? . . . is it possible that new species can be called into being from time to time, and yet so astonishing a phenomenon can escape the attention of naturalists?

[By a critical study of biologically rich regions and of recent geological formations] . . . we may learn which of the species now our contemporaries. . . have made their appearance when the animate world had nearly attained its present conditions.

From such data we may be enabled to infer whether species have been called into existence in succession or all at one period; whether singly or by groups simultaneously; whether the antiquity of man be as high as of any inferior beings which now share the planet with him, or whether the human species is one of the most recent.

Principles, Vol. II, p. 179

Yet Lyell seems ambivalent, and his caution intermittently shines through:

It is idle to dispute about the abstract possibility of the conversion of one species to another, when there are known causes so much more active in their nature, which must always intervene and prevent the accomplishment of such conversions.

Principles, Vol. II, p. 174

Although Darwin seems, at this time, to have entrusted none of his ideas on the mut-

ability of species to paper, with Lyell's tentative notions hammering at the back of his mind, the possibility that one species of organism might, in due time change into another, must surely have occurred to him as he explored the islands of the Pacific he encountered and the entirely novel plants and animals of **Terra Australia**. Consider, for example, his observations recorded on January 19, 1836, near Walerawang, New South Wales:

I had been lying on a sunny bank & was reflecting on the strange character of this country as compared to the rest of the world. An unbeliever in everything beyond his own reason might exclaim, 'Surely two distinct Creators must have been at work; their object, however, has been the same & certainly the end in each case is complete.' Whilst thus thinking, I observed the conical pitfall of a Lion-Ant: a fly fell in & immediately disappeared; then came a large but unwary ant. His struggles to escape being very violent, the little jets of sand described by Kirby (Vol. I, p. 425) were promptly directed against him. His fate, however, was better than that of the fly's. Without doubt the predacious Larva belongs to the same genus but a different species from the European kind. - Now what would the disbeliever say to this? Would any two workmen ever hit on so beautiful, so simple & yet so artificial a contrivance? It cannot be thought so. The one hand has surely worked throughout the universe. A Geologist perhaps would suggest that the periods of Creation have been distinct & removed one from another; that the Creator rested from his labor.

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The 'Geologist' was perhaps himself, for this idea of multiple creations recurs in the **Beagle** writings: six months later, for instance, he was to write to Henslow from St. Helena of that little island as 'this little centre of a distinct creation.'

The association with islands is perhaps worth stressing, for it also links Darwin's fieldwork in the Galapagos, the Western Pacific (which he visited **before** arriving in Australia) with his studies in the Cocos (Keeling) Group (which he undertook **after** leaving Australia). Concerning the Keelings he wrote to his sister Caroline:

I am very glad we called there. . . The subject of coral formation has for the last half year been a point of particular interest to me. I hope to be able to put some of the

facts in a more simple and connected point of view than they have hitherto been considered. The idea of a lagoon island 30 miles in diameter being based on a submarine crater of equal dimensions has always appeared to me a monstrous hypothesis.

(April 29, 1836, CULM/DAR 223)

All these studies were probably undertaken with Lyell's uniformitarian ideas, including the possibility of a 'succession' of species, in his mind. Many of the quotations from the **Principles** quoted above relate specifically to the volcanic island, coral reef and sea-shore environments that Darwin was encountering in the Pacific and Indian Oceans.

Darwin's coral island hypothesis (the notion that fringing reefs, barrier reefs and atolls are members of a series, that form sequentially as a volcanic peak subsides or sea-level rises) is perhaps particularly worth noting as it expresses Darwin's first flirtation with 'gradualism.' This is thought-form that recurs in a great deal of Darwin's work - the twin notions of the mutability of species and natural selection conjoined in the ideas of the **Origin of Species**, are but two examples. He also utilised the idea of gradualism in, for example, his writing on psychological topics and the subject of earthworms.

Of the later development of these ideas, and its enthusiastic incorporation, sometimes after abridgement into geography and geology, no lengthy litany needs to be given. A few brief annotations must suffice.

W.M. Davis (1850-1934)¹⁷ had an extremely wide conception of geography, and a good deal of his thinking was biological in analogy. He owed a great debt to Darwin. He coined the term **ontography** for 'all the responses of organic forms to their physical environment, whether in physiological structure, in individual behaviour, or in racial habits.'

His doctrines of **stage** in geomorphology and of the '**Geographical Cycle**' represent logical end points, if we may use this phrase, in the application of the thought-form of gradualism to the physical world. (Some would no doubt say they represent the doctrine carried to the point of absurdity!)

T.W. Freeman in his **A Hundred Years of Geography**,¹⁸ put it well:

Fundamentally Davis's thought rested on the presumption of an unbroken chain of causation linking the physical phenomena of the earth's surface, the organic world and human society; and this was an extension of the Darwinian concept of evolution through natural selection to the intellectual and social realm.

And from Davis we may move to J. Cvijić (1865-1927) and A.K. Lobeck (1886-1958) and then to physical geographers and geomorphologists of our own day.

On the theory of distributions

Darwin worked on a broad scale. He sought material from every quarter of the globe, and he was, like Humboldt, a great integrator. His search was for the explanation that would explain a wide range of phenomena. At an early point in his career he wrote in a notebook 'The geology of the whole earth will turn out quite simple.' Ad hoc explanations were inadmissible and were to be deplored. He was committed to the explanatory standards set by Herschell (see above), Lyell, and to some extent Humboldt. One of the 'bold strokes' phenomena in which he was particularly interested was sea level change. He invokes it frequently in his **Beagle** notebooks; it is an important component of the Coral Islands theory; it provides the framework of a very early paper: 'Observations of proofs of recent elevation on the coast of Chile, made during the survey of **HMS Beagle**. . .' (1837). But two years later, the only time in his career that he contributed to the publications of the **Royal Society**, was his 'attempt to prove. . . the. . . marine origin' of some enigmatic scars of Scottish hillsides in his 'Observation on the Parallel Roads of Glen Roy. . .'¹⁹ This he later realised, was 'a great failure,' 'a gigantic blunder' and that 'every word. . . is false.' He had refused to accept the notion of a local glacial barrier being responsible for the empoundment of water. On the whole, however, his rejection of ad hoc explanatory mechanisms on the grounds that he impeded the search for verae causae, was one of Charles Darwin's strengths.

This holding out for a vera causa, led Darwin at one stage into (very gentlemanly) dispute with his two dear friends, Charles Lyell and Joseph Hooker (his relationship with the latter verged on scientific collaboration).

Darwin saw long distance dispersal - the dissemination of propagules across great oceans to remote islands and distant continents - as a logical extension to his ideas on the transmutability of species (he was never overfond of the term evolution). If plants and animals had not been independently created but were derived from common ancestors, it followed that the ancestors of organisms on remote islands must have been transported thither by wind or sea. Thus, in later editions of *The Voyage of the Beagle*, which Howard Gruber has recently demonstrated are subtly evolutionary in temper, Darwin writes of the Cocos (Keeling) Islands in the Indian Ocean:

As the islands consist entirely of coral, and at one time must have existed as mere water-washed reefs, all their terrestrial productions must have been transported here by the waves of the sea. . .

The Voyage of the Beagle, Ch. XX

He quotes evidence of tree-trunks and other plant fragments such as seed, some still able to germinate, washed up on the islands, and continues:

It is interesting thus to discover how numerous the seeds are, which coming from several countries are drifted over the wide ocean. Professor Henslow tells me, he believes that nearly all the plants I brought from these islands, are common littoral plants in the East Indian archipelago.

The Voyage of the Beagle, Ch. XX

Charles Darwin's theory of the dispersal of organisms occupies a chapter, 52 pages in length, (Chapter XI, entitled 'Geographical Distribution') in the *Origin of Species*. At the opening of the chapter he writes:

In considering the distribution of organic beings over the face of the globe, the first great fact that strikes us is, that neither the similarity nor the dissimilarity of the inhabitants of various regions can be accounted for by their climatical or other physical conditions. . . In the southern hemisphere if we compare large tracts of land in Australia, South Africa and western South America, between latitudes 25° and 35°, we shall find parts extremely similar in all their conditions, yet it would not be possible to point out three faunas and floras more utterly dissimilar.

A second great fact which strikes us in our

general review is that barriers of any kind, or obstacles to free migration, are related in a close and important manner to the differences between the productions of various regions.

He goes on to draw attention, particularly, to the dissimilarity of the mammal faunas of the continents:

[I]f the same species can be produced at two separate points, why do we not find a single mammal common to Europe and Australia or South America? The conditions of life are nearly the same. . . The answer, as I believe, is that mammals have not been able to migrate, whereas, some plants, from their varied means of dispersal, have migrated across the vast and broken interspace.

Later Darwin concentrates on remote islands and shows how rare are amphibians and mammals (apart from bats) compared to other organisms that could more easily make the journey.

It was not just that the Galapagos Island finches were distinctive, it was that their nearest relatives were American. He also argues persuasively that the waves, birds and icebergs might act as agents of dispersal.

Surprisingly it was on these matters he was most criticised. Indeed for some time he continued a most spirited correspondence with some of his greatest friends and admirers. The reason for this is perhaps that Edward Forbes had postulated that 'continental extensions' connected 'all the islands in the Atlantic. . . with Europe or Africa.' Darwin in the *Origin* is near-scathing with 'authors [who] have thus hypothetically bridged every ocean, and have united almost every island to some mainland.'

Darwin did not like these land bridges or continental extensions: Like the glacial barriers of Glen Roy they were *ad hoc* explanations, obscuring the *vera causa*, the bold sweep. Yet Darwin constantly needled his friends and scientific colleagues on the matter. The following letter written to Lyell on 16 June 1856 is perhaps typical, and is worth quoting in full:

My Dear Lyell,

I am going to do the most impudent thing in the world. But my blood gets hot with passion and turns cold alternately at the geological

strides, which many of your disciples are taking.

Here, poor Forbes made a continent [extending] to North America and another (or the same) to the Gulf weed; Hooker makes one from New Zealand to South America and round the world to Kerguelen Land. Here is Wollaston speaking of Madeira and P. Santo "as the sure and certain witnesses of a former continent." Here is Woodward who writes to me, if you grant a continent over 200 or 300 miles of ocean depths (as if that was nothing), why not extend a continent to every island in the Pacific and Atlantic Oceans? And all this within the existence of recent species! If you do not stop this, if there be a lower region for the punishment of geologists, I believe, my great master you will go there. Why your disciples in a slow and creeping manner beat all the old Catastrophists who ever lived. You will live to be the great Chief of the Catastrophists.

There, I have done myself a great deal of good, and have exploded my passion.

So my master, forgive me, and believe me, ever yours,

C. Darwin

P.S. Don't answer this, I did it to ease myself.

Only Darwin could have called Lyell, master of the Uniformitarians, 'the great Chief of the Catastrophists'!

In fact, of course, little was known about the actual mechanisms of dispersal. In a letter to Dr. J.D. Hooker some years later (3 January 1860), he observed, in comparing the Australian and New Zealand floras:

Now I maintain against all the world that no man knows anything about the trans-oceanic power of migration. You do not know whether or not the absent orders [i.e., absent from N.Z.] have seeds which are killed by sea-water.

By experiment and persistent enquiry Darwin tried to find out. In his correspondence and notes of the 1850s and 1860s we see him paying children to collect lizard eggs and floating them in sea-water; planting seeds after several weeks immersion in salt water to see if they would grow, attempting to germinate seeds from the pellets thrown up by hawks, and from cakes of mud from the feet of partridges. Yet despite the success of some of these enterprises, Hooker and Wallace proved difficult to convince, although by the time

*Island Life*²⁰ was published (in 1880) the latter seems to have been partially converted.

It is tempting to take the story further and show how the combined power of the ideas of evolution, the mechanism of natural selection as a vehicle for ensuring adaptation to environment, long distance dispersal of organisms (another variant of gradualism, I suppose) had on the development of the sub-discipline of biogeography of the late nineteenth and early twentieth century. Instead I shall simply quote, yet again, Darwin as he writes to his 'dear friend' Hooker shortly before *The Origin* appeared (30 December 1858):

When we are dead and gone what a noble subject will be Geographical Distribution.

Summary and Conclusions

The boundaries of the different branches of science were to some extent less distinct than now, partly because some disciplines were less well developed, partly because of, in England at least, a polymath tradition. Geography as such was somewhat ill-defined.

English men of science in the mid-nineteenth century constituted a tightly knit group. Men such as Darwin, Wallace, Hooker, Herschell, Henslow, and Lyell met frequently, and were in many cases related by marriage. They corresponded and exchanged publications. Through travel, residence abroad and correspondence, this network was in its turn linked to a more diffuse world-wide one. Darwin constituted an important node in this system, for he carried on a prolific correspondence with naturalists and 'men of science' in the Empire, on the continent of Europe and the U.S.A. In some cases it is possible to trace with some accuracy the diffusion of ideas through these networks. The young Darwin was profoundly affected by his position in this pattern of connections, and many of his ideas and techniques, even his most striking ideas, can be traced to what he learnt from his teachers and what he read. And the effect of the more mature Darwin on later science, and indeed all knowledge was gargantuan.²¹ To tease out geographical strands from this webwork of interconnected ideas is not easy. Yet I hope I have indicated that many concepts of importance to geography, particularly, but not exclusively physical geography and biogeography, can be traced to, and through, Charles Robert Darwin.

NOTES

1. J.N.L. Baker (1948). Mary Somerville and geography in England, Geog. Journ., 111.
2. A.K. Johnston (1843). The national atlas of historical, commercial, and political geography constructed from the most recent and authentic sources by Alexander Keith Johnston... accompanied by maps and illustrations of the physical geography of the globe by Dr. Heinrich Berghaus, Professor of Geography, Berlin.
3. Ray's flora of Cambridgeshire (1660), (Catalogus Plantarum circa Cantabrigiam nascentium) has been translated and edited by A.H. Ewen and C.T. Prime, Wheldon and Wesley Ltd., Hitchin, 1975. This edition has a short biography of John Ray, and an account of his work.
Despite the fact that he was the greatest preDarwinian British naturalist, and one of the founders of modern biology, there appears to be only one biography of John Ray: C.E. Raven (1942), John Ray, naturalist: his life and works, Cambridge University Press.
4. Gilbert White's principal work was The natural history of Selbourne, 1789. For a general account of his work see W. Johnson (1928), Gilbert White: pioneer, poet and stylist, John Murray, London.
5. The history and 'sociology' of the English Naturalists' tradition has its own literature. The enquirer wishing to follow this extremely interesting topic further might with profit examine: C.E. Raven (1947), English naturalists from Neckham to Ray, Cambridge University Press, and D.E. Allen (1978), The naturalist in Britain, Penguin Books, Harmondsworth. For a more philosophical and more international approach there is: C.C. Gillispie (1951), Genesis and geology, Harvard University Press.
6. A. von Humboldt (1818). Personal narrative to the equinoctial regions of a new continent during the years 1799-1805, translated into English by H.M. Williams, Longmans, London. Reprinted in facsimile, Theatrum Orbis Terrarum, Amsterdam, 1971.
7. _____ (1845-62). Kosmos: Entwurf einer physischen Weltbeschreibung, Stuttgart, was partly translated into English by C.E. Otte and W.S. Dallas, appearing as Cosmos: a sketch of a physical description of the Universe, London, 1849-1858.
8. Darwin's autobiography was not published in his lifetime. It appeared, edited by his granddaughter, N. Barlow, as The autobiography of Charles Darwin, J. Murray, London, 1957.
9. Many of Darwin's letters have been published, edited by his son and granddaughter: F. Darwin, editor (1887), The life and letters of Charles Darwin, John Murray, London (3 volumes); F. Darwin, editor (1903), More letters of Charles Darwin, John Murray, London (2 volumes). N. Barlow, editor (1967), Darwin and Henslow: the growth of an idea, Bentham-Moxon Trust and John Murray, London.
Most of the references to Darwin's letters in this paper are taken from one or other of these sources, although recourse was also had to the Darwin Archives in Cambridge - see below, note 11.
10. C.R. Darwin (1845). The voyage of the Beagle, John Murray, London. The version used here is the 'Everyman' edition, J.M. Dent and Sons Ltd. The first edition was published in 1839 as the Journal of researches into the geology and natural history of the various countries visited by HMS Beagle, being the final section of Captain FitzRoy's account of the voyage: Narrative of the surveying voyages of His Majesty's ships Adventure and Beagle, 1826-1836, Henry Colhoun, London.
11. Darwin Archives, Cambridge University Library Manuscripts Collection (CULM) DAR 38.1/864.
12. E. Manier (1978). The young Darwin and his cultural circle, D. Reidel, Dordrecht and Boston.
13. C. Lyell (1830-1832). The principles of geology, being an attempt to explain former changes of the earth's surface by reference to changes now in operation, John Murray, London (3 volumes).
14. H. Gruber (1980). Darwin on Man, Second edition, including appendix: The many voyages of the Beagle, University of Chicago Press.
In the appendix to this edition Professor Gruber argues that while most of the first edition of The Voyage was written before Darwin's ideas on the transmutability of species were fully formed, the 1845 edition, coming after his 1837 'insight' or 'conversion,' and the Sketch of 1842 and Essay of 1844, is subtly evolutionary in its approach.
15. C.R. Darwin (1859). The origin of species, John Murray, London.
16. See notes 10 and 14.
17. W.M. Davis (1899). The geographical cycle, Geographical Journal, 14, 481-504, reprinted in Geographical Essays, edited by D.W. Johnson (1909; Dover edition 1954).
18. T.W. Freeman (1961). A hundred years of geography: 1861-1961, Gerald Duckworth and Co. Ltd., London.
19. C.R. Darwin (1839). Observations on the parallel roads of Glen Roy and other parts of Locharver, with an attempt to prove that they are of marine origin, Phil. Trans. Roy. Soc., 31-81.
20. A.R. Wallace's most significant works include his joint contribution, with Darwin (arranged by Lyell and Hooker) read to the Linnean Society of London on 1 July 1858: "On the tendency of species to form varieties and of the perpetuation of varieties and species by means of natural selection." This was republished in Evolution by natural selection, edited and with a foreword by Sir Gavin de Beer, Cambridge University Press (1958).
Amongst Wallace's other works are: The Malay archipelago, Macmillan and Co. (1869), and Island life, Macmillan and Co. (1880).
For a short scientific biography see, R. Bernstein: Wallace: the man who almost pipped Darwin, New Scientist, 3 June 1982, 652-665.
21. For an account of Darwin's work on a wide range of branches of scholarship see D.R. Oldroyd (1980) Darwinian impacts, Open University Press, Milton Keynes, and N.S.W. University Press, Kensington, N.S.W.

Friedrich Ratzel's Travels in the United States: A Study in the Genesis of his Anthropogeography

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"North America, this [is a] wonderland of modern culture. . . . Every germ of culture, which here in Europe has to be laboriously extracted from the debris and dust, from the tortuously entangled undergrowth which the centuries have allowed to grow up, and often enough suffocates before it even comes to light -- every such germ prospers there in a soil both fresh and unspoiled, rich in the forces of youth, and prospers as luxuriantly as corn and wheat on the black soils of the prairie."¹

OVER A DECADE ago Carl Sauer devoted one of his last published pieces to the subject of Friedrich Ratzel's (1844-1904) trip to the United States in 1873-75.² In it Sauer, for the most part, recounted and discussed Ratzel's impressions of the cities and country he observed as he travelled across the continent, and gave a good sense of the color, imagery, and overall perceptiveness of the young geographer's written accounts. The present essay once again takes up the theme of Ratzel's travels in North America, but considers them in a rather different regard, namely that of the significance of Ratzel's observations and reflections for the evolution of his human geography in general, and in particular for his political geography. It is suggested that this significance is more fundamental than has generally been realized,³ and that a consideration of Ratzel's North American⁴ impressions in fact offers some very useful insights into the development of his thinking. On the one hand, Ratzel had since the end of the 1860s been developing certain geographical concepts and theories, and his travels in the New World offered him his earliest and most important opportunity to apply these theories to a body of empirical observations, on the basis of which they could then be generalized into anthropogeographical laws or principles. On the other hand, and perhaps more significantly, the New World exposed Ratzel to a type of society and pattern of development which differed in im-

portant ways from that which he had known in Europe. These differences impressed him greatly, and suggested themes which quickly became important elements in his system of human geography.

Ratzel's Early Intellectual Development and his Trip to the United States

By academic training Ratzel was a natural scientist. After completing an early apprenticeship as a druggist, he attended universities in his native Karlsruhe and in Heidelberg, where he received his doctorate in 1868. The 1860s had witnessed the rapid spread of Darwinian teachings throughout German universities, where in the lectures and writings of teachers such as Ernst Haeckel it often took the form of an all-encompassing and crude scientific materialism. The underlying conviction of this early German Darwinism was that the development and behavior of all phenomena of the organic world were equally subject to the dictates of certain natural laws. These laws were to be determined on the basis of empirical observations of the plant and animal worlds, and once determined served as a sort of ultimate explanation for the universe. Human beings, and human society, insofar as they were part of the organic world, could also be explained in terms of these natural laws, and thus the study of natural science became the basis, at least inspirationally, for the social sciences as

well. Here are to be found the origins of what later became known as Social Darwinism. This materialism and preoccupation with natural science together formed a Weltanschauung that gained enormous popularity at German universities during this period,⁵ and one which Ratzel largely assimilated in the course of his graduate work. He studied zoology, paleontology, and geology, and his dissertation was a study of the worm family oligochaetes. He was, moreover, an enthusiastic admirer of Haeckel, and travelled in 1869-70 to Jena to audit the latter's lectures.⁶ Ratzel's publications from these years are devoted mostly to studies of the plant and animal worlds, and to Darwin's theories themselves. Human society as such did not yet interest him, or rather interested him insofar as he could treat it exclusively as a biological phenomenon, essentially undifferentiated from the rest of the organic world and subject entirely to the natural laws governing it. His first monograph, a popular history of evolution, is an extreme example of this viewpoint.⁷

Ratzel's thinking, however, was still very much in the process of development, and his perspective as just described was modified as in the early 1870s he made what was probably the most important intellectual contact of his life. In late 1871 and early 1872, having recovered from serious head wounds received in the war with France, Ratzel spent several months in Munich, where he met and quickly befriended the ethnographer and geographer Moritz Wagner. Wagner, one of the most widely-travelled explorers in Germany at the time, had also been one of Darwin's earliest German converts,⁸ but soon became critical of one aspect of the theory of evolution, namely that of natural selection. Briefly, Wagner felt that the process of natural selection as described by Darwin was incomplete in that it lacked a necessary spatial dimension. He proposed to fill this gap with a so-called migration -- later separation -- theory. Groups of homogeneous plant or animal populations, localized on a distinct territory, survived here until their numbers increased beyond the capacity of the territory to support their continued existence. This led to the splitting off of small groups from the larger population which then migrated in search of sustenance. This splitting off from the main group and migration were, according to Wagner, a necessary pre-requisite for natural selection, which could then take place

among the migrants if they established themselves in a region totally isolated from the original group. The natural environment in the new region would presumably differ at least somewhat from that of the old, and adaption to it would take place by the process of natural selection and evolution.⁹

Wagner's teachings had an inordinately strong effect on the young Ratzel. Under Wagner's influence he shed much of Haeckel's materialist extremism, and even began to take a critical distance from aspects of Darwin's theories themselves.¹⁰ Moreover, it was Wagner who stimulated Ratzel to turn his scholarly attention to man, and to make human society per se the principal subject for his studies. In this sense he may be seen as the ultimate inspiration behind Ratzel's development of his anthropo-, or human geography. Ratzel was well aware of his debt to Wagner and never ceased to pay tribute to him, the most significant expression of which was Ratzel's lengthy dedication of his seminal **Anthropogeographie** to his "highly respected, fatherly friend."¹¹

By the early 1870s, then, Ratzel had gathered the intellectual foundation on which he was to base his subsequent work in geography. From his university training he had been thoroughly steeped in Darwinian natural science, which both served to establish mankind as a life form essentially similar to the rest of the organic world, and moreover presumably made Ratzel sensitive to the conditioning influence which the environment exerts on the development of organisms through natural selection. Wagner had emphasized the importance of the migration of organisms, and although Ratzel was not primarily concerned, as his mentor had been, with specific refinements and corrections of Darwin's proposed mechanism of evolution, still the idea was no less significant. As Ratzel came more and more to study human society, he saw the migration, or simple movement of peoples as the fundamental characteristic of human history, and life itself. "Life is movement,"¹² he ultimately concluded, and "the theory of migration is the fundamental theory of world history."¹³ Yet these various theoretical underpinnings were not in themselves enough: the well-trained and conscientious natural scientist Ratzel needed to proceed inductively, to derive generalizing theories on the basis of observations of the real world around him. The opportunity for this was to come

quickly with the offer of a trip to the United States.

Since 1869 Ratzel had been working as a travel correspondent for the *Koelnische Zeitung*. He made excursions to southern France and Italy and contributed popularly written accounts of the flora and fauna of the regions he visited. This activity was interrupted for the period of the Franco-Prussian war and his subsequent recuperation, but he resumed his travels in 1871.¹⁴ Now Ratzel journeyed to Eastern Europe, visiting Bukovina, Transylvania, and Hungary, and in 1872 again to Italy. In his pieces for the *Koelnische Zeitung* Ratzel demonstrated the unusual literary talent which was to characterize all of his writings, and his columns must have been very well received,¹⁵ for the following year the editors offered him a trip to the United States. As he later emphasized, no conditions or stipulations were set on his activities: he could travel where he wanted and do what he wished, as long as he continued to supply interesting material for the readers. Ratzel eagerly accepted the offer, and in July, 1873 took ship, via Southampton, for New York City.¹⁶

Ratzel spent nearly two years travelling across the United States and Mexico. From New York he first spent one month wandering in the Adirondack mountains, then went north to Boston, where he became acquainted at Harvard with Louis Agassiz, the famed zoologist and opponent of Darwin, shortly before Agassiz's death. From Boston Ratzel journeyed south along the coast, stopping off in Philadelphia, Washington, D.C., Richmond, Charleston, and Columbia before reaching the Florida peninsula. He then headed west along the Gulf coast to New Orleans, where he followed the Mississippi upstream, then passed through Cincinnati, and continued further north, ultimately reaching the Canadian border at Niagara. From here he travelled to Chicago and St. Louis, and then more or less due west to San Francisco, spending a month in the Rockies near Denver. On the West Coast he made trips in the Sierra Nevada and the coastal ranges, and in October, 1874 shipped out south along the coast to Mexico. From Acapulco he traversed the country three times in three weeks, visited Mexico City and Oaxaca, and sailed from Veracruz for Europe, stopping over in Cuba. He arrived in Germany in June, 1875.¹⁷

Upon his return to Germany Ratzel immediately resigned from his position with the *Koelnische Zeitung*. He had been offered the chair of geography at the Technical University in Munich, which he accepted. This marked the end of Ratzel's period as a traveller and the beginning of an academic career which was to make him one of the most important figures in modern geography. He immediately set about gathering together and sifting through the material from his North American trip. This material provided the exclusive basis for three of his next major monograph publications, and the essential inspiration for a fourth,¹⁸ amounting altogether to over 2500 pages of text. Much of Ratzel's narrative is descriptive, but it contains a good measure of reflection as well, especially the regional geography of the United States. Here it is possible to see him deepening and clarifying the ideas discussed above in light of the observations he had gathered, as well as developing new ideas suggested during his travels. Altogether they were to provide much of the foundation for his general conceptions of human geography, and it is to an analysis of them that we will now turn.

Environmentalism and Migration in the North American Context

Ratzel's geographical analysis of the United States is founded on a consideration of the natural environment. The entire first volume of his regional geography is devoted to a description of this environment, and, more importantly for our purposes, the discussion of the different aspects of American society present in the second volume seeks constantly to relate them back to the physical habitat. Ratzel viewed American society as the product of specific environmental influences and conditions, and his development of this viewpoint may be seen as his first -- and really only -- extensive case study of the principle which was to form the basis for his human geography as a whole. Above all else Ratzel was struck by the significance of the mere size of the American continent and by the fact that this territory was as yet relatively lightly populated, if not entirely empty. This for him was the fundamental fact of the American natural environment, in the light of which all remaining aspects must be understood. Lest his European readers be insufficiently appreciative of this point, he brought it out clearly in the first pages, in

a section entitled "The Natural Conditions of Cultural Development." The immense expanse of the United States, he wrote:

... must from the outset restrain one from any quick parallels with conditions in Europe. Across this broad region a population is spread equal in numbers to that which in Germany lives on a territory 1/15 of the size. In all respects in which mankind is influenced [by natural conditions], the inhabitants of the United States are directly opposed to us Europeans by the free room for movement (*Spielweite*) which they, in a purely spatial sense, possess. The deep significance of this difference is often insufficiently appreciated. North America is thinly populated, Europe is overpopulated, the latter dispenses with its excess, it sends off emigrants, while the former takes them in. . . . [The Americans] seem to be greatly influenced in their process of development by the mobility which the consciousness of free space (*Spielraum*) and the necessity of conquering this space brings out in each individual.¹⁹

The concepts of mobility, under- and overpopulation are important in other regards as well, and will be discussed at a later point. What is important to note is that they are raised as functions, so to speak, of America's boundless expanse.

Ratzel interprets the influence of America's open spaces on the abstract level of national culture. In a section entitled "The Immediate Effects of Nature on the Spirit (*Geist*) of the People" he identifies these spaces as the most important environmental factor working to mold the American spirit. From it the people have absorbed a boundlessness (*Schranklose*) into their own character, from which derive their essential optimism and energy. The "great plans" which the American conceives and often realizes, his "lack of timidity in the face of the unknown" simply because it is new, his tendency to consider "nothing which can be undertaken in the first place as ultimately impossible," his general well-being: all of these traits derive not from America's democratic constitution, its universal suffrage, or even religious freedom, but rather most importantly from "the expanse of unsettled land, which demands only work in order to give rich rewards, from the limited concentration of population, the **elbow room** which each individual finds, from the youth of the people."²⁰ The fact that this expanse has such an inordinately strong effect on American society derives from what Ratzel

repeatedly termed the "youth" of that society. It is not yet fully formed, but rather still very much in the process of spreading over the continent, populating it, and exploiting it economically. Only when this process is accomplished will it be possible to speak of it as a "mature" people or society, and until this point Americans stand closer to their natural environment, are more dependent on it, and will be subject to its large-scale immediate effects.²¹ That this development of American society will be balanced and moderate, and not result in extremes of any sort, relates likewise to environmental considerations: it seems assured by the overall moderate (*massvoll*) character of the American physical environment, which like the European develops "an average (*mittlere*) degree of activity, which is as remote from the rigidity (*Starrheit*) of the polar regions as it is from the excesses of the tropics."²²

The notion of American society as young and particularly dependent on the environment is further developed in Ratzel's view of it as a colonial society. In this the environment plays a more mediate, but overall no less important role. The United States are, or were originally a wild, primeval country, and the newly-arrived European settlers were confronted at first with nothing less than a struggle for existence against the elements. In the course of this struggle the previous cultural accumulation of the settler is sacrificed in his daily grim toil to secure food and shelter: "the struggle for existence requires that European fine upbringing must be thrown overboard to make room for the earthy qualities of the back forest. . . ." ²³ This is a sort of de-culturizing process inherent in colonizing movements, which is reversed in proportion to the extent that the environment becomes tamed and the settler's existence increasingly secured. However, insofar as the United States are unceasingly colonizing in a westward direction, the process is being continually repeated, and the society still displays elemental colonial characteristics. As examples of these Ratzel identifies the traditional qualities associated with frontier life: the yearning for a free and independent life, as well as a certain tendency toward equality and democracy, and a marked development of the practical and pragmatic side of one's nature at the expense of abstract or intellectual creativity. Once again Ratzel identifies the factor of open space as the significant element determining the nature of

colonial society.²⁴

A final example of Ratzel's environmentalism may be seen in his consideration of natural regions in North America. He admits to a certain uniformity in America's broad territorial expanse, a uniformity which differs basically from the broken and highly differentiated regions of the European continent. Ratzel borrows from Ritter's teleological imagery and maintains that, to this extent, the United States are not "pre-destined by nature to be the theater of numerous special historical developments," as had been the Old World. This fact, he notes, has led to arguments which insist that America's physical uniformity will result in the development of the same uniform monotony in American society as resulted, for example, from similar conditions in China. Such reasoning, however, is not correct. If a certain uniformity is apparent at present, this is due to the fact that sparse settlement has not permitted regional differences to emerge. There are in fact a number of physical regions in the United States -- not, it is true, on the scale of Europe, but distinct nevertheless -- and given time and full settlement these regions will produce distinct population types.²⁵ Once again falling back on Ritterian teleology, he stated

There is no doubt that within the United States itself there are sufficient external conditions in order to create with time definite population types based on the different natural regions. The North, South, and Pacific regions are in this respect with certainty pre-destined [by nature], for they contain not only the most varied conditions for life and activity, but also the qualities for highly differentiated ethnic mixing.²⁶

In fact, this process has apparently produced certain results already, for Ratzel distinguishes between two types which were apparent in American society: the "New Englanders" and those from the South Atlantic states, whom Ratzel typifies as "Virginians." The differences between these types derive from the different physical conditions in the regions and the resulting differing patterns of economic and historical development.²⁷

It has been seen that Ratzel's attention had been directed to the concept of migration through his contact with Moritz Wagner, who had treated it as a biological principle. In

the United States Ratzel was able for the first time to observe this process as a feature of human society, and on the basis of these observations he remolded Wagner's teachings into a fundamental principle of his own anthropogeography. Probably the most striking aspect of migration in the American example was the colonization of the continent itself: the line of settlement was constantly shifting in a westward direction, which meant that population was constantly in motion as new regions were settled either by new immigrants from the Old World or by Americans who simply preferred to change their location and perhaps style of life. In either case the result was a general physical mobility quite unlike anything Ratzel had known in Europe, and was one of the characteristics of American society that impressed him the most.²⁸ The mobility which he observed in the United States helped lead him to the conclusion, formulated later in his *Anthropogeographie*, that "mobility is an essential characteristic of all national life (*Voelkerlebens*), which is common to all peoples, even those who are seemingly stationary."²⁹

The United States presented however not only a picture of internal expansion and spread of settlement. From all parts of the earth people poured into the New World, and its very existence thus attested to a process of migration of world dimensions. It was the prospect and effect of human migration on this scale that truly fascinated Ratzel, for it brought about close contact and exchange between the most varied cultures of Asia, Africa, and Europe. He witnessed the results of such contact in the United States, where his attention was drawn particularly to the Chinese. By the time of Ratzel's visit the Chinese had already attained a significant presence there, made more conspicuous by their successful resistance of the tendency for most immigrants to be absorbed in one way or another into the mainstream of American society. Ratzel's interest was so stimulated by the example of the Chinese in the United States that he devoted his *Habilitation* research, carried out immediately after his return from North America, to the general examination of the phenomenon of modern Chinese emigration. The resulting dissertation was arguably his first work in the field of human geography. On the whole, his evaluation of the effects of this migration in the United States are positive. The characteristic Chinese qualities --

the ability for hard work and enduring fortitude -- enable them to perform duties unappealing for those of European origin, while their highly modest style of life allows them to be easily satisfied.³⁰ On a deeper level, Ratzel's observations in the United States helped him to identify a more abstract cultural-historical value in human migrations of this nature: the stimulation which follows upon the appearance of "new peoples" in older cultures (*Kulturkreisen*). Out of this intrusion "new forces are set in motion, and new ideas distributed." These new peoples, regardless of their own historic past, bear in the new *Kulturkreisen* the "gifts of youth," which however have a value only insofar as they "destroy a cultural formation, the bearers of which no longer have the forces to renew it. . . . The progress of historical development becomes more and more one-sided and unbearably monotonous if newly arriving peoples do not from time to time boost it up with their young energy. . . ." ³¹ Using these remarks as he does to preface a study of Chinese emigration, it is clear that he ascribes this significance to it as well.

When Ratzel produced the first systematization of his perspectives on human geography -- the first volume of his *Anthropogeographie* in 1882 ³² -- he indicated that this branch of geography had two fundamental analytical tasks: to describe 1) the movements of mankind in relation to their dependence on the land, and 2) the effects of the natural environment on the human body and spirit, both as individuals and collectively as peoples.³³ The rudiments of both of these concerns had been present in Ratzel's thinking before 1875, but his experiences in the United States had given him the opportunity to apply this perspective so to speak empirically, most importantly to see how principles and laws of natural science could be applied to human society. As we have seen in this section, in North America Ratzel found excellent material on the basis of which to develop these ideas. Through his discussion of the American environment and society he clarified and sharpened his thinking in preparation for the major theoretical statement which was to come a few years later. The following section will treat ideas which, unlike those just discussed, were not a part of Ratzel's theoretical perspective on arrival in the United States, but which rather were new, and suggested to him by his observations on the spot.

Political Expansion, *Grossraum*, and the Nature of the Volk

The particular process of migration which Ratzel witnessed in the United States -- that of a steadily advancing frontier of settlement -- brought about the beginnings of a departure from the teachings of Wagner. Wagner's primary interest had been in supplementing and completing Darwin's scheme of evolution, and had stressed the importance of migration and the resulting isolation *per se*. Ratzel, however, was now concerned with the significance of the concept for human society, and migration came more and more to mean the change or expansion of an area of settlement, in other words, colonization.³⁴ The United States provided an example of this, for the migrants did not simply move, but rather moved somewhere and ultimately settled on a specific location, bringing their mobility to at least a temporary halt. The picture was thus essentially one of the territorial growth of the society, and migration was significant as the mechanism of this expansion. This process, like the fact of America's vast expanse, was something quite new to Ratzel, and had no parallel in the Europe of his time.³⁵ His subsequent reflections on it contributed to the development of a perspective which was to be the basis for his most specialized and important work in human geography, namely his political geography: a dynamic view of the state as an organism, for which physical growth -- i.e., territorial expansion -- is a normal, healthy, and indeed necessary process. Unlike the points discussed in the preceding section, Ratzel did not treat this subject at particular length in his earliest writings on the United States, and the following discussion of North American influence on the development of his views will therefore draw more heavily on his statements in later works.

Ratzel's conceptualization of the state as an organism was suggested by the materialist *Weltanschauung* discussed above, according to which human societies were equated with other organisms of the plant and animal worlds. It was fully developed in his later writings on political geography, but appeared in reference to the United States already in his regional geography.³⁶ The organismic character of the state meant that it, like other organisms, experienced growth and development, which was expressed primarily by an increase in its physical size. The dynamic behind this growth

was ultimately supplied by the pressures which a growing population exerted on the resources available within the original state territory: in other words, from the circumstance of relative overpopulation, a fact of which as we saw in the preceding section he was made more aware by the contrast he observed in North America. Physical growth was accompanied by the development of a more complex social structure, economy, and so on. Ratzel expressed this in his assertion that states of small size (*Kleinstaaten*) had always been associated historically with lower levels of cultural development, while more advanced states were physically large. He did not indicate specifically what dimensions he has in mind by the qualifications small or large, but maintained that the most advanced states of the present day -- that is, Europe and its colonial off-shoots -- are all to be considered large.³⁷

Ratzel immediately qualified this last statement, however, and this is the real point of significance for our discussion. The imperative behind the physical growth of states is ultimately supplied by the pressures which an increasing population exerts on the resources within the original state territory. Thus there is a ratio of sorts between population and carrying capacity, and no absolute or universal measure of overpopulation. We have seen in the preceding section that Ratzel was much impressed by what he perceived as the under-population of the American continent, which was both a mark of its youth and health, as well as insurance for its future growth and prosperity. He in fact adopted the American example as a sort of typology for the purposes of his political geography, to which he gave the name *Grossraum*, or large space. *Grossraum* was the trend of the future, it was the next stage of development which all advanced states of the modern world would have to reach if they were to survive. Again, Ratzel was not specific on what sort of dimensions he had in mind, but one thing was eminently clear: the proportions of *Grossraum* exceeded those typical for the European state system, and examples of it were consequently to be found only in the non-European world. "The growth of political areas in Asia and America has in our time caused more attention and study to be devoted to the question of space than ever before. Large spaces are becoming more and more an ever-present tendency of peoples and state development. . . ."³⁸ The vast open spaces of the American continent, which had so

impressed Ratzel in their effect on the American national psyche, now offered a model for the course which future political development must take.

Ratzel intended his vision of *Grossraum* to serve as a warning to the European who was complacent with the order of things as they were. Europe had for centuries been experiencing a steady growth in population, such that at present it was the most densely populated world region. This had been the reason for Europe's political and cultural vitality in the modern era, but had now reached a point of over-saturation: Europe was definitively overpopulated, and was compelled both to shed excess population in the form of emigration and to import foodstuffs to supplement its own productive capacity. Thus the European states were cramped in their present boundaries and faced with the necessity of increasing their territories in line with the idea of *Grossraum*, but at the same time tormented by the complexities of realizing this goal, for the European continent was already effectively occupied and no empty spaces were available there for settlement. In this situation Europe was both inspired and challenged by the developments in this regard which it witnessed in other parts of the world, notably North America:

Europe feels its future threatened by the greater capacity for development [i.e., opportunity for expansion] of the non-European world. It purchased its advantage of a compressed location in the moderate zone, most advantageous for the development of culture, at the cost of the disadvantage of very limited (*engen*) space. . . . How simply and successfully has state-building taken place in North America in comparison to Europe!³⁹

There was of course no question of Europe solving its dilemma on the American model, for adjacent territory was not available. Rather, European states would attain their *Grossraum* through territorial acquisition of "empty" land in the non-European world, that is, through imperialist expansion. Indeed, it was precisely as support for the development and maintenance of a German overseas empire that Ratzel developed his system of political geography in the 1880s and 1890s, and he expressed this concern neatly in his observation that "in the future he who is biggest [i.e., strongest, healthiest] within Europe will be he who is biggest outside of Europe."⁴⁰

The easing of population density through the political acquisition of new territories acted as a great national stimulus. Here again the United States, along with Australia, served as an example: "In any event the new broad space provides a stimulation towards renovations, which the old squeezed-in (*eingezwängte*) peoples cannot allow themselves."⁴¹ Moreover, an outflow of population into new lands had the effect of easing social conflicts which had intensified precisely in the old, crowded conditions. "Conflicts which in conditions of close crowding only multiply, are smoothed out again if they find space for expansion and the possibility of different grouping."⁴² Here again Ratzel's analysis displays a similarity with that of Frederick Jackson Turner and the "safety valve" effect of the frontier, and Ratzel used this image in his own arguments for German expansion overseas. He pointed to the importance of this factor in the early pages of his regional geography of the United States,⁴³ and writing on the theme at the end of the century he made explicit the debt to his observations in North America for this insight:

I believe I learned the following in America, and that I am justified in applying the lesson to Europe: the art of politics consists to a great extent in directing political conflicts out of restricted spaces, where they corrode on each other like ulcers. In this is to be found the benefit which the expansion of [available] territory has brought the world. This process [of political expansion] is not an exorcism of the evil, but rather a healing distribution [of the conflicts] for long into the future.⁴⁴

The vision of a state which is steadily expanding raises questions about the relationship of the state to the natural environment. Specifically, it is an implicit contradiction of the view that the boundaries of the state should coincide with those of a natural region, a view which could otherwise quite logically be deduced from Ratzel's environmentalism discussed above. However, his biological conception of the state as an organism, with its own independent dynamics for growth, took precedence over environmental influence in this regard. About this Ratzel was most outspoken. Again, he used his observations in the United States to develop this point. The differences which do in fact exist between the natural regions in the United States will not necessarily lead the

American state to follow the example of "old Europe" and break down into a number of smaller, independent political entities. Quite to the contrary, the vigor and youth of the American people, plus the advantages of steam and electric power, will aid them in maintaining their political unity. The conflicts manifested in the recent Civil War did not, he maintained result from natural regional differences, but from entirely other sources, and do not therefore present fundamental obstacles to this unity. He expressed himself unequivocally in the following manner: "a well-circumscribed political and cultural region need not coincide with a distinct geographical province: to the contrary, it seems that the United States [as a political entity] will come to encompass several of these provinces."⁴⁵ This point is most important, for it marks a definite conceptual break with the Ritterian tradition, and in fact it may be seen as a contradiction of sorts of Ratzel's own principles of environmental influence, which were strongly inspired by Ritter. In terms of the territorial organization of political life, he argued, man is not restricted to the configuration suggested by the natural environment, but rather himself creates and alters political formations through independent action. Certain types of natural-geographical environments, such as islands, may at first be conducive to the development of a state with certain characteristics,⁴⁶ but under normal circumstances of organic growth the state cannot ultimately be restricted spatially to them.

It remains to consider briefly the effect of Ratzel's experiences in the United States on the evolution of his views of ethnicity and nationality. These were questions which became increasingly important in political life as the nineteenth century progressed, especially in Central and Eastern Europe. Intensified in some respects by the spread of the racialist doctrines of Arthur de Gobineau and Houston Stewart Chamberlain, the significance and intrinsic value of ethnic purity and a distinct ethnic identity were by the turn of the century generally taken for granted, and not rarely the object of passionate devotion. In political terms, this expressed itself in the belief that the ethnic national group should form the basis and limit of the state. On all of these issues Ratzel took an unorthodox position, which is already discernible in his early writings on North America.

Simply put, in the United States Ratzel was confronted by a large-scale process of ethnic mixing and assimilation. He observed that the American population was made up of the most diverse groups -- British, German, French, Spanish, Chinese, African and so on -- and was impressed by the ability of conditions in the United States to effect a Verschmelzung, that is, a fusion or amalgamation of these different groups, the result of which was a new, young people or Volk.⁴⁷ What made this Verschmelzung possible were precisely the factors which have been discussed above: the broad open spaces of the American environment and the dynamic expansion of the people to fill and settle them. In his Anthropogeographie he formulated this process as a historical law: "A broadly open territory favors... the mixing, the flowing together of different peoples," and elsewhere in the same work: "The formation of spatially large peoples could proceed only through the amalgamation (Zusammenschluss) of fragments of different territories, each settled by a distinct race (Rassengebiete)."⁴⁸

In the context of the climate of ideas in the late nineteenth century just described, Ratzel's idiosyncratic interpretation was significant indeed. To him the Volk or ethnic group was a much more ephemeral and on the whole less important phenomenon than for many of his contemporaries. The fact that it could and did absorb new and foreign elements into itself led him to question and reject the notion of ethnic or racial purity so popular at the time, and indeed he explicitly rejected the racialist doctrines of de Gobineau and Chamberlain.⁴⁹ Applying these ideas consistently, he went one step further and rejected the political formation which had re-shaped the political map of Europe in the nineteenth century and remained a dreamy goal for many national groups of Central and Eastern Europe: the nation-state, which was based on the proposition that the ethnic group should serve as the basis of the political state structure. A nation-state of this sort violates the geographical laws of political development and growth, for it a priori circumscribes the physical extent of the state to the limits of the distribution of the ethnic group, and thus from the outset renders impossible the expansion which Ratzel postulated as a life necessity for the political organism. In short, a nation-state is incompatible with the notion of Grossraum. Because

of his views, Ratzel remained detached from the vicious strife of the time among the nationalities in Europe, and condemned this antipathy as backward-looking.⁵⁰ The perspective which he offered instead of the nation-state, however -- that of unceasing physical expansion -- was in the light of subsequent experience no less, and perhaps even more, dangerous.

To sum, the ideas examined in this section are ones which Ratzel did not simply develop further on the basis of observations in the New World, but which came rather directly from his experiences there. It has been argued that the vision of the state as a political organism which like other organisms undergoes growth and accordingly becomes physically larger was suggested to him by the example of the United States, as was the all-important concept of Grossraum. While he acknowledged the fact that the physical conditions in North America were fundamentally different from those in Europe, and in a sense unique, this did not prevent him from generalizing the process into a descriptive law of political geography, which then could be and from the mid-1880s on was applied by him with full validity to the situation at home, to both explain and encourage European imperialist expansion. The same may be said about his views on nationality: again they were suggested by the Verschmelzung he witnessed in the United States, which was radically different from anything he had known in Europe, and contradicted much of the dominant ideology on this question at the time. This as well he incorporated into his political geography, and used it to support his pleas against the nation-state as an ideal goal of political organization.

Conclusion

Despite Friedrich Ratzel's stature as one of the few truly great figures of modern geography, the nature of his geographical ideas has to the present remained surprisingly obscure. The present essay, which was intended as a contribution toward a clarification and analysis of these ideas, suggested that an early important source for them is to be found in Ratzel's observations during his trip through North America in 1873-75. On the basis of his American experience Ratzel was able to apply to human societies ideas which he had acquired earlier in the course of his studies and research as a natural scientist.

The results of this were his conclusions about the molding influence of the environment on American society, and his conviction of the essential importance of migration in that society. These insights were then re-stated several years later as the fundamental principles of his *Anthropogeographie*, valid for the whole of mankind. Beyond this, Ratzel's observations suggested to him entirely new ideas concerning the growth of political areas. These too were subsequently re-stated as general principles, and indeed the greater part of all his writings, from the *Anthropogeographie* of 1882 to his death, was devoted to elucidating them. His crowning *opus* was his *Politische Geographie* of 1897.⁵¹ Among the other significant "external" influences which helped shaped Ratzel's thinking -- for example, the German emigration,⁵² European imperialist expansion, or Germany's perceived challenge from England as the world's dominant sea-power -- his trip to the United States stands out as one of the most important. It is not too much to say that through it Ratzel became a human geographer.

Acknowledgements

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NOTES

1. Friedrich Ratzel, *Staedte- und Kulturbilder aus Nordamerika*, 2 vols., Leipzig: Brockhaus, 1876, I, pp. 3-4.
2. Carl O. Sauer, "The formative years of Ratzel in the United States," *Annals, Association of American Geographers*, 61 (1971), pp. 245-254.
3. One recent noteworthy exception is Karl George Faber's excellent essay on Ratzel's political geography: "Overall the experience of [Ratzel's] trip to the United States... [for his human geography] cannot be evaluated highly enough..." ("Zur Vorgeschichte der Geopolitik. Staat, Nation, und Lebensraum im Denken deutscher Geographen vor 1914," in Heinz Dollinger, et al., editors, *Weltpolitik, Europagedanke, Regionalismus. Festschrift fuer Heinz Gollwitzer zum 65. Geburtstag*, Muenster: Aschendorff, 1982, pp. 389-406, reference to p. 393.
4. Ratzel travelled mainly in the United States, with brief periods in Mexico and the Caribbean. He did not visit Canada. The terms "American" and "North America" in this essay, therefore, follow his usage and refer primarily to the United States.
5. Fritz Stern, *The politics of cultural despair*, Berkeley: University of California Press, 1961, pp. 122-123. On Darwinism in Germany see William M. Montgomery, "Germany," in T.F. Glick, editor, *The comparative reception of Darwinism*, Austin/London: University of Texas Press, 1972, pp. 81-115.
6. Friedrich Ratzel, "Ernst Haeckel," *Meyers Deutsches Jahrbuch*, I (1872), pp. 555-558; Guenther Buttmann, *Friedrich Ratzel. Leben und Werk eines deutschen Geographen, 1844-1904*, Stuttgart: Wissenschaftliche Verlagsgesellschaft mbH, 1977, p. 26.
7. Friedrich Ratzel, *Sein und Werden der organischen Welt. Eine populaere Schoepfungsgeschichte*, Leipzig: Gebhardt und Reiland, 1869. This book was in fact essentially a popular re-telling of Haeckel's *Generelle Morphologie*, which had appeared the previous year. It is a good example of the strong racialism and Social Darwinism -- justifying, among other things, the dying out of native peoples resulting from contact with and colonization by Europeans as a "natural process" (pp. 495-496) in which this type of extreme scientific materialism could result. (On this point see Daniel Gasman's study of Haeckel: *The scientific origins of national socialism*, London: MacDonald & Co., 1971, *passim*.) Ratzel came very quickly to shed these extremist views, as explained below.
8. Hanno Beck, "Moritz Wagner als Geograph," *Erdkunde*, VII (1953), pp. 125-128, reference to p. 126.
9. Moritz Wagner, *Die Darwin'sche Theorie und das Migrationgesetz der Organismen*, Leipzig: Duncker und Humboldt, 1868, pp. 17, 37-38ff.
10. Johannes Steinmetzler, *Die Anthropogeographie Friedrich Ratzels und ihre ideengeschichtlichen Wurzeln*, Bonn: Selbstverlag des Geographischen Instituts, 1956 (Bonner Geographische Abhandlungen, Heft 19), pp. 89, 95-97.
11. Friedrich Ratzel, *Anthropogeographie*, 2 vols., 2nd ed., Stuttgart: Engelhorn, 1899-1912, I, Dedication; Beck, "Moritz Wagner..." p. 127; H. Ganslmayr, "Moritz Wagner und seine Bedeutung fuer die Ethnologie," *Verhandlungen des XXXVIII. Internationalen Amerikanisten Kongresses*, Bd. IV (1972), pp. 459-470, reference to p. 465.
12. Friedrich Ratzel, *Die Erde und das Leben. Eine vergleichende Erdkunde*, 2 vols., Leipzig/Vienna: Bibliographisches Institut, 1901/1902, II, p. 571.
13. Ratzel, *Anthropogeographie*, I, p. 195.
14. Ratzel's own sense that he lacked a certain basis of empirical observation and that he therefore needed to see more of the world is indicated by the fact that he rejected at this time the offer of a position in a natural history museum in Stuttgart ("Lebenslauf von Friedrich Ratzel," in Friedrich Ratzel, *Kleine Schriften*, Hans Helmolt, editor, 2 vols., Munich/Berlin: Oldenbourg, 1906, I, pp. XXI-XXXIII, reference to p. XXV).
15. Some of Ratzel's columns were collected and published as *Wandertage eines Naturforschers*, 2 vols., Leipzig: Brockhaus, 1873-1874.
16. "Lebenslauf von F. Ratzel," p. XXVII.
17. *Ibid.*, p. XXXVIII; Buttmann, *Friedrich Ratzel*, pp. 43-46.
18. Friedrich Ratzel, *Die chinesische Auswanderung*, Breslau: F.U. Kern, 1876; *Staedte- und Kulturbilder...*; *Aus Mexico. Reiseskizzen aus den Jahren 1874 und 1875*, Breslau: F.U. Kern, 1878; *Die Vereinigten Staaten von Nord-Amerika*, 2 vols., Munich: Oldenbourg,

1878-1880. The last-named work is an exhaustive regional geography of the United States. The first volume deals with the physical environment, and the second with American society itself. The first edition of this work -- the one just cited -- is the edition used in this essay, as it preceded Ratzel's other major geographical works and thus affords the best perspective on the development of his thinking. The second volume was reissued in 1893 in a much-revised edition, and has a significance in its own right (see note 51).

19. Ratzel, Die Vereinigten Staaten, II, p. 4.
20. Ibid., pp. 46, 605.
21. Ibid., p. 45.
22. Ibid., p. 47. The Ritterian inspiration behind Ratzel's notion of a regional environment "developing" such a quality is obvious. In general Ratzel's anthropogeography owes more to Ritter's work than is generally realized, and a detailed study of this influence would be very enlightening (cf. Steinmetzler, Die Anthropogeographie Friedrich Ratzels, . . ., pp. 109-114).
23. Ratzel, Die Vereinigten Staaten, II, pp. 172, 616.
24. Ibid., p. 514. The similarity of Ratzel's ideas on colonial societies with those underlying F.J. Turner's famous "frontier thesis," formulated a decade later, are striking, and should be more thoroughly explored. Turner's perspective in many regards was that of environmental determinism. He had a high regard for geography, and in fact had considerable contact and correspondence with Ratzel's most important American disciple Ellen C. Semple. Perhaps through this contact, or through independent study, Turner was influenced by Ratzel (cf. Karl-Georg Faber, "Geschichtslandschaft - Région historique - Section in History," Saeculum, 30 (1979), pp. 4-21, passim).
25. Ratzel, Die Vereinigten Staaten, II, pp. 46-47.
26. Ibid., p. 21.
27. Ibid., pp. 598-599.
28. Ibid., p. 606.
29. Ratzel, Anthropogeographie, I, p. 113.
30. Ratzel, Die chinesische Auswanderung, pp. 265-266. Ratzel points out, however, that this could ultimately have a negative influence, for a people which does not within itself balance higher intellectual and cultural activity with the "raw activity of the peasant, the shepherd, and the day laborer" risks decay at the roots. Also see Die Vereinigten Staaten, II, pp. 217-218.
31. Ratzel, Die chinesische Auswanderung, p. 1.
32. Anthropogeographie, oder Grundzuge der Anwendung der Erdkunde auf die Geschichte, Stuttgart: Engelhorn. A second volume -- Die geographische Verbreitung des Menschen -- appeared in 1891. The second edition (see note 11) is the one used in this essay.
33. Ratzel, Anthropogeographie, I, pp. 77-78.
34. "Too much is said about migrations, and too little about settling down (Festsetzung) and its difficulties. If the bio-geographers could only decide to use the term colonization instead of migration" much confusion could be avoided (Ratzel, Die Erde und das Leben, II, p. 597). "A people, a race, a species must necessarily colonize as it migrates. What is referred to as migration is therefore in reality the growth of a region of inhabitation (Lebensgebiet) beyond its former space. . ." (Friedrich Ratzel, "Der Lebensraum. Eine biogeographische Studie," in K. Buecher, et al., editors, Festgaben fuer Albert Schaeffle zur siebenzigsten Wiederkehr seines Geburtstages am 24. Februar 1901, Tuebingen: Verlag der H. Laupp'schen Buchhandlung, 1901, pp. 101-189, reference from p. 128).
35. The territorial expansion and internal colonization of the Russian Empire were factors that for Ratzel served to distinguish it from Europe and make it into a New World, similar to the United States.
36. Friedrich Ratzel, Politische Geographie, oder die Geographie der Staaten, des Verkehrs und des Krieges, 3rd ed., Munich/Berlin: Oldenbourg, 1923, p. 3ff; Die Vereinigten Staaten, II, p. 13fn.
37. Ratzel, Anthropogeographie, I, p. 236-238; Politische Geographie, pp. 153-155. The view of the state as an organism was popular at the time, and developed among others in the work of Oskar Hertwig, Josef von Held, and Albert Schaeffle, to all of whom Ratzel referred in his own writings. What is striking is that nowhere in these other works is physical growth and expansion, which Ratzel emphasized, seen as a necessary function of the state's organic existence. A good example of this is Johannes Unold's Politik im Lichte der Entwicklungslehre (Munich: Ernst Reinhardt, 1912), one of the classic presentations of the organismic view of political life. Despite the fact that the author cites on several occasions from Ratzel's Politische Geographie, he nowhere treats physical expansion as a foregone conclusion, and indeed clearly views it as but one possibility, if an expanding population should happen to make it necessary (pp. 41, 43). Ratzel's emphasis on physical growth was thus an important elaboration of Social Darwinist political theory, which he arrived at precisely because he had actually witnessed the expansion of the United States.
38. Ratzel, Politische Geographie, p. 264.
39. Ibid., pp. 257 (quote), 106-107; also see Anthropogeographie, II, p. 191.
40. Ratzel, Politische Geographie, p. 257. The very important question of the relationship between Ratzel's system of political geography and late 19th-century imperialism was explored in greater depth by the author in a paper "Imperialism, Social Darwinism, and Friedrich Ratzel's Political Geography," (IGU Symposium on the History of Geography, Geneva, 1984).
41. Ratzel, Anthropogeographie, I, p. 251.
42. Ratzel, Politische Geographie, p. 272.
43. Ratzel, Die Vereinigten Staaten, II, p. 4.
44. Friedrich Ratzel, Gluecksinseln und Traeume. Gesammelte Aufsaezte aus dem Grenzboten, Leipzig: Fr. Wilh. Grunow, 1905, p. 476. These ideas serve to link Ratzel with the tradition in Germany and Europe in general known as social imperialism, by which is meant the attempt to solve conflicts within the country by means of political expansion beyond the limits of the nation-state. This perspective is to be found for example in the writings of Friedrich Naumann. (See e.g. Hans-Ulrich Wehler, Bismarck und der Imperialismus, Koeln: Kiepenheuer und Witsch, 1969, pp. 114ff for a fuller discussion.) For a more extensive presentation of these ideas in Ratzel's work see his Wider der Reichsnoergler. Ein Wort zur Kolonialfrage aus Waehlerkreisen, Munich: Oldenbourg, 1884, esp. p. 13.

45. Ratzel, Die Vereinigten Staaten, II, pp. 12 (quote), 505.
46. See for example Ratzel, Politische Geographie, pp. 466-485; or his "Inselvoelker und Inselstaaten," Kleine Schriften, II, pp. 294-310. passim.
47. Ratzel, Die Vereinigten Staaten, II, pp. 591-592. Ratzel even spoke at one point of the creation of a new "Anglo-American" race out of all these various groups (*ibid.*, p. 48). As a German he was particularly disturbed by the absorption of his countrymen who had emigrated to the New World into the American mass (*ibid.*, pp. 596-597fn.), and several years later even used this spectre to argue for the need for Germany to acquire its own agricultural colonies to which Germans could emigrate and still retain their German identity intact (Ratzel, Wider der Reichsnoergler, pp. 10-11).
48. Ratzel, Anthropogeographie, I, pp. 47, 243.
49. Friedrich Ratzel, "Nationalitaeten und Rassen," Kleine Schriften, II pp. 462-487, reference to pp. 482-487. The question of racism in Ratzel's thinking is an important one, and made more so by erroneous interpretations advanced in some recent treatments. He quickly shed the extreme racist views which went along with the radical Social Darwinism of his earliest work (see note 5). While he did indeed persist in the conviction, common for his time, of differences in the levels of development between peoples -- of "backward" and "advanced" societies -- his environmentalism led him in his later work to reject the existence of in-born inherited genetic or racial differences among mankind. Biologically the human race is one species, of which all members are equal (e.g., Die Erde und das Leben, II, p. 617). In this important regard, therefore, Ratzel is set off very clearly from the ideology of the National Socialists after World War I, who based their entire Weltanschauung on supposed genetic differences between races (Faber, "Zur Vorgeschichte der Geopolitik," p. 389ff.).
50. Ratzel, Politische Geographie, pp. 144-145, 162-163.
51. Indeed, in the same way that the first edition of his regional geography of the United States (1878-1880) preceded the appearance of his Anthropogeographie (1882) so his Politische Geographie (first edition 1897) was preceded by a thoroughly revised second edition of the second volume of the regional geography (1893). The more direct orientation toward political geography is indicated immediately by the differing titles he gave to the different editions: the first edition is entitled "Cultural Geography, with Special Attention to Economic Geography," while the second is quite simply "Political and Economic Geography." In the latter book Ratzel was obviously working out ideas on the basis of his American material that he was subsequently to present as general principles of his political geography, a fact indicated by the close similarity in chapter headings and general organization of the 1893 and 1897 works.
52. Woodruff Smith "Friedrich Ratzel and the Origins of Lebensraum," German Studies Review, III (February 1980), pp. 51-68, reference to pp. 63-68) especially emphasizes this factor.

Jonathan Garst (1893-1973): An American Pioneer in Applied Geography

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"A PPLIED GEOGRAPHY," a term that goes back about a century, has been used with increasing frequency in recent years, although one is not always sure what the users have in mind. Just as there is no perfectly "pure" geography, there is probably no such thing as a completely applied (non-pure? impure?) geography. As a practical matter, however, few of us have any great difficulty in determining the sense in which the term "applied geography" is used. We might define applied geography as "any use of geographical knowledge to obtain practical results, usually for remuneration, and usually outside the classroom." Perhaps we should further restrict the definition by adding something to the effect that this geographical knowledge is formally acquired from academic geographers, in order to keep all civil engineers, farmers, miners, etc. from claiming the label. I like William Morris Davis's illustration of the term "applied geography"; to him it meant making money from the sale of his textbooks. In a letter to John Scott Keltie of the Royal Geographical Society in 1903, Davis said:

You may be interested to know that my two books, *Physical Geography* & *Elem. of Phys. Geog.* sold last year to the number of 40,000 or more -- & the publishers think that pretty good. It has one good effect, anyhow. It enables me to leave Mrs. Davis & the boys in a very comfortable summer house on the seashore -- with a good boat for sailing & spare rooms for friends to occupy. That is what I call 'applied geography.'

Now that we have defined applied geography as anything that a geographer does to earn money apart from teaching, let us turn to Jonathan Garst and see what he did to deserve such an appellation. Who was Garst, and why

should he be given space in the annals of geography?

Jonathan Garst was born in Coon Rapids, Iowa, 4 December 1893, attended schools in Rockford, Illinois, and graduated from the University of Wisconsin in 1915 with a B.S. degree in agriculture (soils). After a brief period of farming in Coon Rapids and military service in World War I, he studied geology, history, and economics for six months in the University of Edinburgh. From 1919-22 he tried his luck at farming in Manitoba. He returned home to look after his ailing father in 1922, and, when the latter died the next year, Jonathan went to work for the E.B. Clark Seed Company in Salinas, California. At the beginning of 1926 he went abroad to study geography, first at the University of Grenoble for six months under Raoul Blanchard and then for the academic year 1926-27 at the University of Edinburgh with Alan Ogilvie, where he worked on "the climatic influence in soil formation." He wanted to return to the United States in the summer of 1927, preferably to California, in order to work on his dissertation and perhaps do some teaching at the same time. At Ogilvie's suggestion he wrote a letter to George McBride of the University of California, Los Angeles on 11 June to inquire about possibilities there. Ogilvie and McBride had worked together at the American Geographical Society in New York for a few years (c.1920-22). McBride received Garst's letter with much enthusiasm, and he immediately hired him to teach at UCLA at the rank of Associate, a title then used in the University of California system for newcomers who did not have a Ph.D. degree. Garst stayed at UCLA for two years, 1927-29, teaching the following courses: *Elements of Geography*, *Regional Geography*, *History of Geography*, and *Cartogra-*

phy. His salary in the academic year 1928-29 was \$2200, whereas McBride, as Associate Professor and Chairman, received \$3900.

At UCLA Jonathan Garst was apparently a stimulating teacher, but he proved to be something of a maverick, and he was not always properly respectful towards the views of older members of the department. At least this was the impression that I got from my late colleague Joseph Spencer (1907-84), who was employed as an undergraduate grader in Garst's introductory course, went to Berkeley for graduate work at Garst's suggestion in 1929, and began his 35-year teaching career at UCLA in 1940. Spencer's description of Garst sounds a little like descriptions of Spencer himself. A telling comment on the relations of the two men can be seen in Spencer's dedication of his book *Asia East by South, A Cultural Geography* (1954): "To Charles A. Spencer [father], who excited in his small son a perennial curiosity about people and places; Jonathan A. Garst, who motivated a critical questioning of man and the earth; Carl O. Sauer, who pointed up a philosophy of human culture and environment."

In 1929 Jonathan Garst left UCLA to return to Edinburgh to finish his dissertation, which he did the next year and thus became the fourth person to receive a doctorate in geography from that university. He had given up his original dissertation topic and wrote instead "A Geographical Study of the Los Angeles Region of Southern California." After doing some soils work in the Outer Hebrides, Garst returned to the United States and began to work for the U.S. Department of Agriculture, an agency that would employ him off and on for the next three decades. In the 1940s and '50s he raised and processed hybrid seed corn in the Sacramento Valley of California and served on numerous governmental agricultural missions overseas. He always remained in close touch with his younger brother, Roswell, who became a prosperous farmer in Coon Rapids, Iowa and achieved international fame in 1959 when he played host to Nikita Krushchev, the Soviet Premier, during the latter's celebrated visit to the United States. Roswell supplied the title for Jonathan's book *No Need for Hunger* (Random House, 1963). This was Jonathan's only book-length publication ("Anyone is entitled to blow up once in a lifetime," he said), and in it he gave a distillation of his life in agriculture. The book was "conceived in anger and dedicated to

the proposition that almost everybody ought to have all they [sic] want to eat." The anger resulted from the sensational treatment of Krushchev's visit to Coon Rapids. Krushchev had come to Iowa to find out how to grow more food, but there was no chance to explain how that could be done, because of the hordes of reporters who were only concerned with petty details of the tour and who got in Roswell Garst's way wherever he turned. Jonathan's wrath caused him to write the book, which was clearly dedicated to the proposition that more food could easily be grown, especially through the application of more and better fertilizers, so that there is, indeed, "no need for hunger." The book is suffused with Garst's unquenchable optimism and his aversion to communism. The fight against communism, he said, should be a war on hunger, not a military action. The book ends with a simple prescription: "Hunger, misery, and the population explosion are all one problem and a problem to be solved first by the production of more food. That is one thing Americans can do."

Jonathan Garst died 25 May 1973 in Berkeley, California, in the Alta Bates Hospital, the same hospital in which Carl Sauer died two years later. How differently things might have turned out for Garst if Sauer had been successful in promoting his return to American academic life in 1932, when the two were in correspondence. Garst might have become another practical-man-turned-academic-geographer, of whom there were several examples in the period before World War II. Instead, he spent the rest of his life in farming and related activities, but we would like to think that his contacts with academic geography--in Grenoble, Edinburgh, and Los Angeles--gave him a broader perspective than he otherwise would have had. Geography can provide the "big picture" that can enhance and extend the knowledge that one gets in farming and other practical pursuits. Jonathan Garst is certainly an interesting example of how an individual can apply his geography.

A NOTE ON SOURCES

My information about Jonathan Garst came from the files of the UCLA Department of Geography; letters from Mrs. Roswell Garst and her son Stephen (a Stanford B.A. in geography) of Coon Rapids, Iowa; and discussions with

Joseph Spencer. The Garsts sent me copies of writings by and about Jonathan Garst, including an especially revealing five-page letter that Roswell Garst had sent "to all G & T [Garst & Thomas Hybrid Corn Co.] salesmen, many relatives and friends" on 4 June 1973. The letter from W.M. Davis to J.S. Keltie (13 May 1903) is from the Royal Geographical Society Archives.

After this paper was completed and sent to the editor, a biography of Roswell Garst was published by the Iowa State University Press: **Roswell Garst, A Biography**, by Harold Lee (RG's son-in-law) (Ames, Iowa: Iowa State University Press, 1984). The book contains much information about Jonathan Garst, especially in relation to Roswell and other members of the family.

The Region in Twentieth Century British Geography

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THE TERM "REGION" is one of the most widely-used in the geographer's vocabulary. Probably as a consequence, there is no consensus on its detailed meaning, nor on the concept that it implies. In general usage within the English language, a region implies a division, usually of the earth's surface. (The term is even more generally employed to indicate proximity, in a wide range of context.) To geographers, this division of the earth's surface must be undertaken according to accepted criteria and methods, so that regional definition is presentable as scholarship rather than pragmatism. But how and why such division should be undertaken, and what the ontological status of the resulting regions is, are all topics of some contention. Thus one of the discipline's fundamental concepts - to some its sole fundamental concept - is a focus of debate, controversy, even derision.

The broad notion of the region - defined as a relatively homogeneous portion of the earth's surface - is common to many national geographical traditions. There are links between these; British work on regions, for example, has been influenced to some extent by French, German and North American writings. But there are also separate, national elements, reflecting the amount of independent development that has occurred during the twentieth century. (Perhaps this is an indicator of regional differences itself!) This essay focuses on the use of the term "region" in British geography, with little or no reference to the possible influence of the seminal works of de la Blache, Hettner, Hartshorne and other scholars.

This essay is not a history of the use of the term region and of the regional concept in twentieth-century British geography. Ra-

ther it is a broad treatment that seeks to identify the major strands in nearly a century of writing on the subject. As James and Martin (1981) have pointed out, the regional concept refers to

the mental image of an earth's surface differentiated by an extremely complex fabric of interwoven strands and produced by diverse but interrelated processes (p. 371)

whereas to many the idea of a region is simply

an uninterrupted area possessing some kind of homogeneity in its core, but lacking clearly defined limits (p. 372)

The two are clearly linked, but James and Martin point out that

There are at least three different meanings to regional studies as a characteristic of British geography. . . And none of these three kinds of regional study is necessarily involved with the regional concept (p. 207)

The aim here is to identify these various types of study, to indicate present concerns in Britain with respect to regional geography, and to suggest reasons for the divergent usage. The framework for the discussion is provided by the ideas of Herbertson, considered by many as the founder of British regional geography.

A.J. HERBERTSON AND NATURAL REGIONS

Although he certainly did not invent the term region, the concept of the natural region, or the idea of regional geography, bringing these to a central position in British geographical practice is an achievement generally ascribed to the Oxford geographer

A.J. Herbertson. (For appreciations of Herbertson's work, see Gilbert, 1965, and Dickinson, 1976.) It was the definition and study of regions, and the promotion of regional geography, that dominated the last decade of Herbertson's life (Jay, 1965).

Herbertson's first, and major, statement regarding the concept of the region was in a paper presented to the Royal Geographical Society in 1905 on "The major natural regions: an essay in systematic geography" (Herbertson, 1905). His main purpose was to propose a division of the earth's surface into "natural" units that would provide a framework for the presentation of geographical material which was superior to the political unit then much used (Freeman, 1980, p. 192). Geography, he argued, is

the study of phenomena from the point of view of their distribution on the surface of the earth, in natural groups, and not as isolated phenomena (p. 301).

Thus geographical study involves the integration of all spatial distributions (not necessarily giving each equal weight). The configuration of the land surface is a necessary but far from sufficient variable for the definition of geographical units - the objects of geographical investigation. Geographers are concerned with

definite areas of the surface of the Earth considered as a whole, not the configuration alone, but the complex of land, water, air, plant, animal, and man, regarded in their special relationship as together constituting a definite characteristic portion of the Earth's surface (pp. 301-2).

According to Herbertson, therefore, a region is a whole, in many ways analogous to the concept of an ecosystem (Stoddart, 1965).

Although Herbertson argued for a holistic approach, his illustrations in the 1905 paper suggested the predominance of a few variables in the definition of regions: thus

The facts of configuration and of climate are of first importance, but the distribution of vegetation, and even of men, may also profitably be examined (p. 302).

His "natural regions of the world" were based on three variables only: structural geology; temperature belts; and seasonal rain-

fall. In the paper, only five lines were allocated to vegetation - "The vegetation map may be looked upon as a commentary on and a summary of the climatic ones" (p. 306) - and 15 were allocated to the distribution of population, including the statement that political divisions of the earth's surface were too volatile to provide a valid basis for regional delimitation (see also Roxby, 1926).

Herbertson continued to argue the holistic conception of the region. In 1913, he asked

Why separate organisms from their environment? Plant associations could not exist without a physical environment. The physical elements and the organic elements are but parts of a whole. The higher unit is not physical, nor biological, but geographical (Herbertson, 1965, p. 336).

The higher units were "geographical entities," which Herbertson identified at several scales (localities, districts, regions, groups of regions). Definition of these entities was proposed along the same lines as in the 1905 paper when, in the discussion that followed, his thesis was taken to be that structural and climatic elements (termed orographical there) were sufficient for regional delimitation. With regard to man, this meant that

He is too often considered a thing apart, or at best an active agent in a passive medium . . . We are surely long past the days of quarrelling about whether a man is dominated by heredity or by environment. He is influenced by both; he is, as it were, part of both. . . . We have not yet grown to look at him as but a small part of a complex whole whose control of him we can but slightly trace (Herbertson, 1965, p. 341).

In Herbertson's holistic system

if the geographical region is a macro-organism then men are its nerve cells. . . he is no more, though no less, to be considered apart from the rest of these [regions]. . . than the nervous system is to be considered apart from the rest of the organism of which it is an essential element. For purposes of investigation it is often necessary to consider one element alone; but for the full understanding of the organism, or of the macro-organism, the nervous system, or the human society, cannot be separated from it (p. 341).

Finally, in a posthumously-published paper Herbertson (1915) developed his ideas regard-

ing the human element of the region - the "nerve cells" of that organism - in a discussion of environment, heredity and regional consciousness. Regarding the environment, he argued that it is much more than the physical circumstances of the region

There is a mental and spiritual environment as well as a material one. It is almost impossible to group precisely the ideas of a community into those which are the outcome of environmental contact, and those which are due to social inheritance (p. 149).

Thus the region is a complex whole, comprising an interacting system of man and physical environment, each essential to the other. Disciplinary specialists may investigate particular elements of that system, but they cannot interpret the whole, which is expressed as the "regional consciousness" (p. 152).

To Herbertson, the region is the key concept in what we now term the social sciences, and the study of this concept is the domain of geography:

... for the understanding of history, or economics, or politics, or any study of mankind, it is necessary (i) to realise that the wholes which are greater than the individual are geographical, (ii) to grasp the idea of a region and the need for a feeling of regional consciousness (p. 152).

The systemic qualities of the region are clear, and involve man-environment interactions:

It is not merely a passive environment, a theatre of human action of which we must know the stage properties. It is something alive, active, not merely letting man act on it, but vigorously reacting on man (p. 153).

Together the environment and man produce the regional consciousness (it is not only organic, but also vital; Stoddart, 1967), which is in no way deterministically created:

This involves no purely materialistic interpretation of history or of geography. The geographer is no more confined to materialistic considerations than the historian. There is a *genius loci* as well as a *Zeitgeist* - a spirit of a place as well as of a time. No social psychology is worth much that is not

also regional psychology, and no regional psychology is possible without a loving familiarity with the region (p. 153).

Geography's Inheritance from Herbertson -

Although not explicitly formulated as such, the concept of the natural region that Herbertson promoted was analogous to that of the ecosystem - developed by plant ecologists in the 1930s and presented to geographers as an organising concept three decades later (Stoddart, 1965, 1967). Herbertson went further than suggesting an organic analogy - that the region is equivalent to an ecosystem - however. Not only did he compare the region to a plant and an animal but he also introduced the notion of regional consciousness, suggesting an analogy not simply with a machine (a complex of interdependent elements in which the whole is greater than the sum of the parts) but with an individual human which is an organism plus a consciousness (which separates the human animal from all others); this is known as vitalism.

Although far from complete, Herbertson's ideas provided a valuable resource that geographers could mine for the development of the subject. The region was presented as a central element in the nascent social sciences, as the clear focus of geographical interest and the framework for its pedagogic enterprise. It was also promoted as a practical as well as an academic concept. Gilbert (1965), p. 324 makes clear Herbertson's commitment to applied geography and the central role of the region in this. Unfortunately, although Herbertson presented geographers with a concept, he did not also provide a methodology. Ecology provides a partial answer to this, but only with regard to the organic analogy, and not also to the vitalism (the "spirit of place") that accompanied it in Herbertson's later writings. Thus, according to Stoddart (1965, p. 242)

British geographers, in their quest for the region and its spirit, exemplified in the work of Herbertson, held up as an ideal a concept which defies rational analysis and which should have died with the biological vitalism which inspired it.

Because the quest was an impossible one, Herbertson's ideals were modified, and somewhat devalued, in the work of his inheritors.

THE REGION IN BRITISH GEOGRAPHY BEFORE c. 1960

Herbertson's concept of the region, although substantially criticised when presented to the Royal Geographical Society in 1905, was widely adopted among British geographers during the early decades of the twentieth century. The region and regional geography occupied the central place in the discipline's activities and *raison d'être*. No concept is immune to criticism, however, especially among academics, and a variety of critiques developed. These have been summarised by Grigg (1967, p. 471) as follows:

1. The criticism of the idea of the region as a spatial, organic entity. If such entities do not exist, then the rationale for geography as the identifier and interpreter of regions disappears too.
2. The criticism of the concept of the region as a clearly bounded entity. The covariation of phenomenal distributions across the earth's surface is far from complete, so that most regional boundaries are really broad frontier zones where one phenomena-complex merges into another. At its extreme, this criticism suggests that regions do not exist but are academic abstractions.
3. A criticism that focuses on the often-presumed link between physical environment on the one hand and human activity on the other, which has strong implications of environmental determinism.
4. A criticism of the static treatment, which does not allow either for change (including a change in regional boundaries) or for links between regions in a single world system.

To realise the basis for these criticisms, it is necessary to appreciate how the concept of a region was used by geographers - mainly during the period 1910-60, when it dominated the discipline.

The Region as a Homogeneous Spatial Unit - A clear implication of Herbertson's statements, especially in his 1905 paper, is that the world can be divided up into discrete spatial units, each with its characteristic assemblage of physical and human phenomena. This idea was taken up by a number of authors, such as Unstead and Roxby, who accepted the organism analogy (Roxby, 1926, p. 377), and

who proposed methods of regional delimitation. In most cases, definitions were favoured that took a number of variables into account. Roxby (1914), for example, proposed that the study of the agricultural geography of England be undertaken on a regional basis, which was basically a correlation exercise relating agricultural practice to the physical environment:

it would be a great gain to scientific economic geography if we could study the distribution of crops and of farm animals in relation to the different geological formations, soil belts, and climatic regions. . . A division of the rural area on a natural basis could thus hardly fail to be useful for purposes of scientific comparison (p. 320).

Thus the regionalisation would not be for didactic purposes alone, but as a means of accounting for the geography of agriculture; the region has genetic connotations, because it is based on an assumed cause-effect relationship, in which the physical factors are **intrinsic**, because they are permanent (Roxby, 1926, p. 381).

Not all regionalisations involved the use of several variables, as Unstead (1916) points out. To him, although regions can be defined on any variable, a **natural region** is defined on the basis of several physical environmental variables, whereas a **geographical region** synthesizes these with material on the human occupation of the area. Neither physical nor human variables should dominate the regionalisation: "geographical regions should also be delimited, taking into account the human equally with the physical factors" (p. 241). Whereas Herbertson had defined his regions at the world scale, however, Unstead suggested working upwards from the local scale, with definition of small, uniform areas - "geographical units. . . having common predominant characteristics" (p. 241) - after detailed field survey. In a later paper, Unstead (1933) termed these smallest units *stows*, which could be combined into tracts, subregions, and regions. With aggregation, the possibility of identifying precise boundaries declined, but "the drawing of a precise boundary is of less importance than the study of the content of the area" (p.185).

The ways in which physical and human characteristics could be combined were considered by a number of authors. Fleure (1919), for

example, proposed a system of human regions "with special reference to their [i.e. human groups'] efforts towards the good life, to the efficiency and the success of human work" (p. 94). Human striving involves three essential functions - nutrition, reproduction, and the increase of well-being and "The results of human effort stand naturally in close relation to the physical conditions of various regions". He identifies regions of hunger, debilitation, increment, effort, lasting difficulty, and wandering, as well as industrialised regions, each of which has particular physical characteristics that have stimulated certain human responses.

A major potential problem with all of these regional schemes is that they could rapidly deteriorate into a case for environmental determinism. Fleure (1919) notes this in his statement emphasising "the importance of the human will and of man's power to modify his surroundings" (p. 94). Nevertheless, many regionalisations allocated primacy to the physical features. In one of the first papers illustrating Roxby's ideas on agricultural geography, for example, Ward (1914) defined six regions "each possessed of physical characteristics sufficiently distinct from those of surrounding areas and of sufficient uniformity to warrant an expectation of their being reflected in the agriculture of the region" (p. 383). The physical regionalisation provided the framework within which human activity was discussed, rather than the two being combined equally before regions were identified - as Unstead suggested should be done, but rarely was (Roxby, 1930, p. 283 argued that "Human geography is the study of an interaction rather than of a control" but this format constrains how the interaction is discussed.) Herbertson's own work suggested this environment-to-human occupancy link of course, and despite his arguments that the region is an organism it was the causal sequence suggested by his original maps that was adopted (in part, as already noted, because no methodology was provided for analysing regional organisms).

This modification of Herbertson's ideal indicates the impracticality of his concept of the region as an analogue of a human organism. In order to identify regions, geographers were constrained to select certain variables as key indicators and, undoubtedly because of the current general ethos of environ-

mental determinism, they chose to use physical environment variables to produce regional maps. This was all based on the assumption that regions exist, that the world is subdividable into discrete areas. (Roxby, 1930, p. 286, talks of "The modern tendency in geography to think of the Earth in terms of natural as opposed to artificial divisions".)

The validity of this assumption was examined in a seminal paper by Crowe (1938). He noted from the outset that "the region is emphatically not an organism" (p. 11) but then asked "is it not possible that the regional matrix may be **organisation**?" (p. 12). In his view, regions - areas of concomitant distributions - are human creations, whose nature and content are constantly changing, in a system of circulation and resource appraisal - unfortunately in most regional work "Overemphasis of the resource aspect has often led to fallacies" (p. 13). For him, the major emphasis in regionalisation should be on transport, on "**men and things moving**" (p. 14). Thus his regional geography involves identifying areas that are linked together through transport and communication flows.

Crowe's opinions were shared and extended by Kimble (1951), who accused geographers of

trying to put boundaries that do not exist around areas that do not matter... [because] From the air it is the links in the landscapes, the rivers, roads, railways, canals, pipelines, electric cables, rather than the **breaks** that impress the aviator (p. 159).

Whereas in an era of poor transport technology the concept of a largely independent, autonomous region may have been sustainable, in the middle of the twentieth century

there will be no independent, discrete units... no "worlds within worlds". There will be no neatly demarcated "regions" where geographers... can study a "fossil" community. Man's "region" is now the world (p. 173).

To try and define regions is to distract attention from real issues, and to avoid realising that man can create the pattern of the earth's surface - constrained by, but in no way controlled by, the physical environment.

The Region, Synthesis, and the *Raison d'Être* of Geography - Despite these criticisms regarding the reality of regions, let alone

the problems of defining them, and the implications of environmental determinism in many regionalisations, Herbertson's ideas were accepted by many and advanced as the core of the discipline. Indeed, according to Wooldridge and East (1958, p. 141)

In later years there has been wide concurrence in the view that regional geography is at least a vital and indispensable part of the subject; some have not denied it the status of "the culminating branch"... the serious student of geography will find much of his time occupied in its study and for the general reader it is and always has been geography par excellence.

Regional geography, as Wooldridge and East describe it, is a synthetic discipline drawing together the work of systematic studies - both within and without geography. Each of these can produce regionalisations, divisions of the earth's surface according to a few criteria restricted to that branch of knowledge. Regional geography does more; its aim (Wooldridge, 1956, p. 53)

is to gather up the disparate strands of the systematic studies, the geographical aspects of other disciplines, into a coherent and focused unity, to see nature and nurture, physique and personality as closely related and inter-dependent elements in specific regions.

Regions are not academic abstractions, according to Wooldridge. They do exist, and their study involves geographers synthesising work from a variety of disciplines - sciences and humanities. Thus the study of regions not only provides geographers with a raison d'être, it also suggests they are a special breed of scholars who synthesise the findings of disparate systematic investigations. Research in regional geography involves immersion in a particular area, so that the researcher can understand both its various parts and their integration into a whole; systematic geography is thus prior to regional synthesis - and, in the last analysis, inferior to it as well.

Wooldridge's concept of the region closely accords with Herbertson's, although he dispenses with the latter's organismic analogy. He believed in both the concept and the existence of **natural geographical regions**. Stevens (1939) disagreed: "You cannot integrate man and his environment" (p. 307). To him, the

crucial elements in the creation of regions are space and communities; physical regions are irrelevant and

The unity of the natural geographical region is achieved, maintained and developed by organisation, by cohesion, and this cohesion is attained and extended by intercourse (p. 310).

With Crowe, Kimble and others, Stevens argues that a synthetic discipline bringing together the results of, say, geomorphology, climatology and economic geography was unnecessary. Regions exist because they are man-made, within a physical environment an account of whose origins is unnecessary to an understanding of the regions.

The Region as a Pedagogic Framework - Despite the criticisms outlined above, for several decades many British geographers argued that the study of regions should be the central focus of the discipline. Geography seeks to understand variations on the earth's surface; these variations are represented in a regional mosaic of physical characteristics interwoven with human activities; thus geography should identify these regions and elucidate their characteristics.

Its questions and procedures are therefore directed to the analysis, assembling, and explanation of earth entities, as unique associations of groups of interdependent spatially distributed phenomena (Dickinson, 1976, p. 378).

It follows from this that "The true geographer is a regionalist... He searches for interpretations of regional entities at any scale" (Dickinson, 1976, p. 382) and that "the regional concept demands disciplinary training at the University level from the undergraduate course to the final doctorate examination" (Dickinson, 1970, p. viii). As a consequence, courses in regional geography dominated many undergraduate curricula, especially the final (synthesis?) year.

According to this view, geography as a discipline studies how various parts of the world differ in terms of variations in the distribution of phenomena - natural and human. Different types of phenomena cluster in certain areas, creating regions, so that the study of regions can both illuminate the

reasons for that clustering - separately and together - by drawing on the findings of systematic studies and illustrate the unique characteristics of the different parts of the earth's surface. Courses and texts in regional geography were prepared:

the fundamental idea was that the small area would legitimately be expected to show some distinct individuality, if not necessarily entire homogeneity, through a study of **all** its geographical features - structure, climate, soils, vegetation, agriculture, mineral and industrial resources, communications, settlement and distribution of population. All these, it has often been said, are united in the visible landscape, linked into one whole and dependent on one another (Freeman, 1961, p. 85).

Unfortunately, the gap between ideal and practice was generally large, with the result that much regional geography was uninspiring. Freeman (1961, p. 142 ff.) identifies three reasons for this. First, much regional geography has been naive, suggesting overly-simple generalisations based on a few physical variables. Secondly, much regional geography is poorly done -

many works on regional geography drag wearily through a sequence of apparently unrelated facts of physical features, climate, vegetation, agriculture, industries, population and the like (p. 142).

Finally, not all areas are clearly unique regions with identifiable "personalities," so that it is perhaps not surprising that their interpretation is pedestrian. Freeman (1980, p. 167) later added a fourth reason: "the attempt of regional geographers to achieve the impossible, to give a complete synthesis based on such a wide range of rapidly developing systematic studies."

Practical Regionalism - British geographers, like most of their fellow academics, have long been concerned that their work should be not only pedagogically interesting but also of practical value. Thus if the region is a central concept in geographical scholarship, it must be of practical value, especially in the planning and organisation of man's spatial relations and inter-relations with the physical environment.

Applications of the regional concept were proposed soon after its launch by Herbertson;

Fawcett (1917), for example, proposed an administrative regionalisation of England. Gilbert (1939) extended this, arguing that for the purposes of regional planning England and Wales should be divided into a series of functional regions, each focused on a regional capital, and that each of these should be further subdivided into "uniform economic regions". Thus

The idea of the region is not only a means for the theoretical arguments of geographers, and a tool for novelists and poets; it also has great practical value for the man of affairs (Gilbert, 1960, p. 171).

Considerable effort was involved in defining these regions. Urban hinterlands, according to some arguments, would be excellent units for local government, combining rather than separating the interdependent town and rural units: bus services were a popular index of the extent of those hinterlands (Green, 1950).

THE "NEW GEOGRAPHY" AND THE REGION

During the 1960s, geography in Britain underwent a major series of changes (Johnston and Gregory, 1983). They involved widespread adoption of a positivist philosophy - often termed a scientific approach - and a gradual separation of human and physical geography. The holistic concept of the region was largely abandoned, systematic studies were in the ascendancy, and research, writing and teaching in traditional regional geography diminished sharply.

Although the holistic concept of the natural geographical region as developed by Herbertson was discarded (Johnston, 1983a, discusses the reasons for this) the more limited definitions of the region as a homogeneous unit with practical value were retained. Regional definition was not as important to this "new geography", however, much of which treated the spatial organisation and physical morphology of the earth as a series of surfaces (that could be correlated one with another) rather than as a mosaic of discrete units (see Haggett, 1965).

The Region in "Scientific" Geography - The major aim of the new geography of the 1960s was to be scientific. Science involves making

generalisations and producing laws, which apply to pre-defined classes of phenomena. Geography as a science, then, was concerned with laws and generalisations about its subject matter, which is places. Similar places should be subject to the same laws; they fall into the same classes. Before science can proceed it must define its classes. For a scientific geography, this involves a classification of places. Thus regionalisation is a form of classification, and is a basic prerequisite to scientific work in geography.

The similarity between classification - as a general scientific process - and regionalisation was explored by Grigg (1965, 1967), in comprehensive reviews of the issues involved. Others agreed with his conclusions, and sought to place regionalisation on an objective footing. Most regional definition was inductive, identifying groups of similar places/areas according to certain characteristics, rather than deductive; the aim was to find the world's regions, in order to account for them. This involved a substantial amount of work developing quantitative procedures for regionalisation (e.g. Spence and Taylor, 1970; Haggett, Cliff and Frey, 1977; Johnston, 1976); quantification was used because of its apparent neutrality, objectivity, and replicability. Because, as earlier geographers had recognised in other contexts, few regions have precise boundaries, major technical issues (never completely resolved) regarding the membership of regions were encountered.

Some of the quantitative regionalisations were produced as ends in themselves, and some as question-positors with regard to the generating processes involved. Because they were based on numerical data, they were restricted to measurable variables, and were simply attempts at identifying areas with common characteristics rather than suggesting unities with holistic qualities. The region was presented as an element in the spatial organisation of society linked to other regions by a complex of flows, and modelled by geographers along the lines of the work of regional scientists. Thus Haggett, Cliff and Frey (1977, p. 451) argue that

regions perform much the same role as a class in any science, and... regionalization may be approached as a special form of classification.

They identify three types of regions.

Homogeneous, or uniform, regions are areas within which variations on the relevant characteristics are trivial but among which they are substantial; they may be defined with regard to either a single or several characteristics. **Nodal**, or functional, regions are areas linked to a common core, with many more internal than external links (or flows). Finally, **planning** regions are defined for particular purposes; an objective in their design "is to maximize overlap between the needs of administration and 'naturally occurring' uniform or nodal regions" (p. 453), so that policy is directed to relatively homogeneous areas, presumably with benefits for all.

Quantitative Definitions of Planning Regions -

Work on planning regions has proceeded on a large variety of topics. Some of it seeks to extend the earlier work on hinterlands, using a range of indicators and more precise criteria for boundary definition (Coombes et al, 1982). Other applications seek relative uniformity in region size and shape (e.g. Johnston and Rossiter, 1981). In almost every case, the regionalisation is pragmatic. The regions defined are areas with similar characteristics and are of use for particular purposes. There is no suggestion that they are anything more, no links with the organic analogy and the concept of the natural geographical region.

SOME RECENT ISSUES

Although the quantitatively-based approach to geography rapidly achieved a position of dominance within the discipline in the 1960s, a complete revolution was not effected. Nor has its dominance remained unchallenged, and even newer approaches have been introduced (Johnston, 1983a, 1983b). Thus there has been considerable recent British debate about the nature of geography. The role of the region and of regional geography has been a part of that debate.

One portion of the debate has involved a defence of, and plea for greater attention to, traditional work. Promoters of the region rarely return to Herbertson's concept. Rather they focus on the existence of regions as significant units in the spatial organisation of society and emphasise the need to present

information about these units, as part of the general education provided by and for geographers. In this context, the precise definition of regions is of little import. Paterson (1974), for example, defines regional geography as

work in which the purpose of the study is to clarify a specific situation in a particular locality; in which, in other words, attention is focused upon the region for its own sake and that of its inhabitants (p. 4).

According to this view, regional geography "is not primarily problem-orientated but concerned to provide balanced coverage, and its aims are popular and educational rather than practical or narrowly professional" (p. 21). The educational need, especially at the school level, has been stressed by Steel (1982, pp. 6-7), who argues that

Unless our pupils have a reasonable background of regional geography - of the right type, of course, of regional information, relationships and problems - how can we expect them to have an intelligent understanding of the news items that they read or hear about.

And Mead (1980) stresses that in order to provide this educational base - "Perhaps it should never have been called regional geography - simply the geography of other lands" (p. 294) - the discipline needs

a cadre of geographers who are prepared to adopt other lands, to share other cultures, to acquire a specialist understanding of them, to make a contribution to the store of knowledge about them, and, in the process, to become the revised version of the regional geographer (p. 297).

And this may have an applied component. House (1978), for example, has argued for an applied regional geography which interprets economic, social and political changes in their regional contexts and evaluates the potential for further changes in the light of public and private sector planning.

Whereas the authors just discussed have argued for a return to an older usage of the region as a pedagogic framework, others have advocated its incorporation with newer perspectives. Work on behavioural and humanistic geography, for example, has investigated whether people's mental maps and images of the environment have regional components and

whether these form the basis for regional consciousness - at a variety of spatial scales, from the neighbourhood to the nation. And those of a structuralist persuasion see the region as part of the superstructure of society. Gregory (1978, p. 171), for example, writes of the

need to know about the constitution of **regional** social formations, of **regional** articulations and **regional** transformations.

Although the processes operating in late capitalist societies are general, their impact is spatially variable, being influenced by the environmental conditions (physical and human) with which they come into contact. Initial differences between areas - perhaps in the physical environment - lead to separate impacts of processes, and these impacts in turn influence later processes and their realisations in different places.

CONCLUSIONS

British geographers inherited from Herbertson the concept of a natural geographical region which was holistic in its emphasis and used the analogue of a vital organism. This analogy was soon rejected, as much because of the difficulty of using it in any but the most general sense as because of its philosophical shortcomings. But the idea of the region was retained, in modified form. James and Martin (1981, p. 207) suggest that British geographers developed three types of regional study: 1) those whose purpose was the division of the earth's surface into homogeneous units; 2) those which provided descriptions of certain segments of the earth; and 3) those in which an individual directed his professional career to understanding a particular area. As suggested here, such studies had stronger pedagogical and practical than research components; a situation which in general still applies.

Throughout the twentieth century, the majority of British geographers have accepted that the earth's surface can be studied as a mosaic of separate regional units. Such regions come about because of the clustering of certain types of human activity in particular areas, in some cases areas with particular assemblages of physical elements. They are not precisely definable, for most have broad frontier zones rather than clearly

delimited boundaries. Thus they are real, yet at the same time abstractions. Their study aids the understanding of the clustering processes, provides a framework for the presentation of material, and can be used as the basis for producing a network of units for planning and other purposes. To most, then, the region is a means to an end, not an organism with its own individuality and personality which is worthy of study for its own sake.

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